Veterinary Medicine

VOL. XXI JULY, 1926 No. 7

ARKANSAS STATE AGRICULTURAL LIBRARY JUL 3 1926

FOOT-AND-MOUTH DISEASE OFFICIALLY DECLARED ERADICATED FROM UNITED STATES

Effective June 10th all domestic quarantine regulations previously imposed by the United States Department of Agriculture because of foot-and-mouth disease in livestock are revoked. This announcement applies particularly to California in which certain areas have been kept under supervision as a precautionary measure. June 10 of this year marks the elapse of exactly a year since the last infection of disease in California was found and destroyed. In the meantime no recurrence of such infection appeared there.

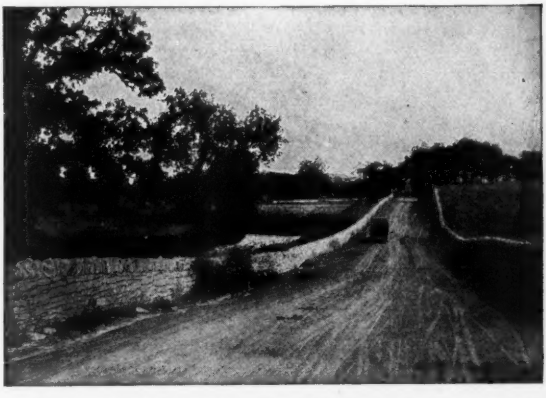
The State of Texas, where foot-and-mouth disease broke out in 1924 and reappeared in 1925, was officially freed from all quarantine April 1, 1926. The situation in California, according to veterinary officials of the Bureau of Animal Industry, was more dangerous owing to the rough and inaccessible character of the land, infection among wild deer, and other complex conditions.

The official document which declares that foot-and-mouth disease has been eradicated from the United States and no longer exists in it is known as Bureau of Animal Industry Order 297, and was signed by Secretary Jardine June 1, to take effect June 10. There still remains in effect the usual restrictions that protect the United States from foot-and-mouth disease and other livestock plagues in foreign countries. Such regulations have been made extremely broad and comprehensive and are rigidly enforced.

Codliver oil facilitates the assimilation of calcium. It has recently been demonstrated that it is not necessary to ingest the codliver oil as sufficient is absorbed when it is applied to the skin of chickens to increase the calcium content of the blood.

Cat fright evidenced by accelerated heart action, hair raising, ear lowering, hissing and snarling are manifestations induced by an increase of adrenalin in the blood. In other words, fright in cats is due to chemical change in the blood due to the liberation of adrenalin from the adrenal glands.

Fowl cholera is prone to occur and is more fatal in fowls that are overfed. It is advisable to destroy birds affected with cholera but they should not be destroyed by chopping off the head for the B. avisepticus occurs in the blood and this method of destruction would spread the infection.



Pike near Lexington, Ky., one of the scenes to be viewed by those who attend the A. V. M. A. meeting, August 17th to 20th.

There is an apparent relationship of the sugar content of the blood and articular disorders due to infection in the human according to Pemberton. The sugar content of the blood is in direct ratio to assimilable sugar consumed and therefore those having a low tolerance for sugar are more prone to articular infections. Thus, the provision of sugar in the diet by use of molasses and like products may be of value in reducing the incidence of polyarthritis in pigs.

A NEW SURVEY SHOWS BOVINE TUBERCULOSIS DECREASING

Cooperative tuberculin testing, by federal, state and county forces, has reduced the percentage of tuberculous cattle in the United States from 4 per cent in 1922 to 2.8 per cent in 1926, according to a survey completed May 1, by the United States Department of Agriculture. Information was also gathered which indicates that by 1926 approximately 31 per cent of the entire country will have reduced the percentage of infection to less than one-half of one per cent and will thus be classed as "modified accredited" area.

But of more interest perhaps are the figures showing that most of the infection is confined to a comparatively small area. While the percentage of diseased cattle varies from less than one-half of one per cent in some counties to more than 23 per cent in others, practically 73 per cent of the estimated reactors yet to be condemned are contained in 411 counties. The other 27 per cent of the estimated diseased cattle are scattered throughout the remaining 2,658 counties where the average infection is less than 3 per cent.

This gives a clear insight into the problem of total eradication of the disease. It is comparatively easy, with sufficient funds available, to free any county with less than 3 per cent infection. The problem, therefore, in this less infected section is one of proper initial testing and sufficient quarantine measures to protect against reinfection from bad herds.

MEXICO ACTIVE IN SUPPRESSING FOOT-AND-MOUTH DISEASE

Mexican authorities are active in suppressing the recent outbreak of foot-and-mouth disease among livestock in the southern part of that country, according to information received by the United States Department of Agriculture through the State Department. Dr. S. O. Fladness, agricultural commissioner for the United States at Mexico City, describes the plans of procedure in eradication as similar to those successfully used in the past by veterinary officials of the United States.

Slaughtering of all infected and exposed stock in Yucatan is in progress. Near Yucatan, in northern Campeche and also in southern Tabasco the infected herds have been slaughtered. A number of infected herds in northern Tabasco, however, still remain to be destroyed. In that region disposal of carcasses by burial is practically impossible owing to the nature of the land, but Mexican officials recently left for Houston, Tex., to purchase equipment for disposal by burning, the method used successfully in the last Texas outbreak.

Mexican authorities have also assured United States officials that movement of all dangerous products from the infected region is absolutely prohibited. Dr. Fladness, who has had experience in eradicating foot-and-mouth disease, is cooperating with the Mexican officials in suppressing the malady in that country, thus reducing the menace to the animal industry of the United States.

According to the Animal Pathology Exchange, University of Illinois, during the first three months of 1926, rabies was recognized in dogs, cattle, horses and sheep in 17 counties in Illinois. Since that time additional cases of rabies have developed in these localities following the bites of rabid animals. The disease has been endemic in certain districts in the southern half of the state for several

years, while the increase in the number of positive cases in known infected districts, as well as the spread of the disease to adjoining counties, suggests the importance of rigid preventive measures. The university laboratory has increased the charge for rabies examination from $1.00 to $5.00.

BRITISH PROHIBIT IMPORTS OF FRESH MEAT FROM CONTINENT

As a result of the discovery of foot-and-mouth disease in hog carcasses from The Netherlands intended for consumption in Great Britain, the British Ministry of Agriculture and Fisheries has prohibited the landing in Great Britain of all carcasses from continental European countries, according to a cable received in the Department of Agriculture from Agricultural Commissioner Foley at London.

The order covers carcasses of cattle and sheep as well as hogs, and also fresh and refrigerated meat of such animals, but does not cover fully cured bacon and ham or rendered fat, cooked or preserved meat or meat essences, or hides and skins which have been dry or wet salted. Imports from Ireland, the Channel Islands and the Isle of Man are not affected by the order.

Should the quarantine continue any length of time, it will be of far reaching significance for the meat trade of the United Kingdom, the Netherlands, all Northern and Western Europe and the United States. The large supplies of fresh pork which have been moving from the Netherlands to the British markets will have to seek other markets or be shipped as cured meat, and Great Britain will be obliged to look elsewhere for its supplies of fresh pork.

In 1925 out of a total British importation of 139 million pounds of fresh and frozen pork, 92 million pounds were from the Netherlands, 20 million pounds from the Irish Free State, and 14½ million pounds from the United States. Of the total of pork supplies in the London Central Markets in 1925, nearly 70 per cent was from the Netherlands. Beef and

International Newsreel

Slug, the three-legged horse, owned by William Saylor of Sabetha, Kans. The animal was found running with a pack of wild horses in Colorado. Despite its crippled condition, the filly, now two years old, is able to get around. It is reported that veterinarians who have examined the animal are unable to account for its condition.

mutton supplies from the continent of Europe are of minor significance on British markets.

This is the first time that the British Government has prohibited the importation of any kind of fresh meat on account of foot-and-mouth disease although for several years there has been a strict quarantine against live animals from countries in which the disease was known to exist.

SERVICE OF LIVESTOCK TO BE SHOWN IN EXHIBIT

Grouped about a central feature portraying the wide range of services which livestock render to mankind, an exhibit has been prepared by the Bureau of Animal Industry, United States Department of Agriculture. The display is 72 feet long and is being shown at the National Sesquicentennial Exposition in Philadelphia which began June 1.

The central theme of the exhibit is brought out by the use of models and paintings illustrating the production of animal products. In the foreground and flanking the principal scene appear scores of products derived from animals. These commodities include not only meats but useful articles obtained from hides, wool, mohair, bone, sinews, feathers, viscera, hoofs, horns, and glands. There are also displays illustrating the quarantine service, tuberculosis eradication, and other veterinary work.

An engrossed book on display carries text as follows:

"From fields, mountainsides, and wastelands our domestic livestock garner forage and give it new useful forms.

"Under the magic of animal life, grass and coarse feed become meat, milk, wool, and leather. Meanwhile, humbly picking up seeds and insects from here and yon, busy domestic fowls supply still other food products; finally the soft plumage of these creatures gives added relaxation to man's rest and sleep.

"The horse and dog—for centuries faithful comrades—perform countless useful duties and add zest to recreation.

"Beyond such familiar services of animals to man lie great contributions to the fruitfulness of our soils, to medicines, music, and myriad needs of household, business, and social life."

The Bureau of Animal Industry is cooperating, also, with livestock and meat organizations in another exhibit. The sanitary and efficient handling of meat products in a model abattoir, and Federal inspection of meats are prominent parts of this display.

According to the National Bureau of Economic Research, the population of the United States on January 1, 1926, was 115,940,000.

According to statistics published by the Metropolitan Life Insurance Company, it costs $6,167 to rear a girl and $6,077 to rear a boy, to maturity.

The National Poultry Council is urging a National Hen Day to unite in a country-wide program to pay homage to the American hen and to stress the great distinction of the egg, together with its merit in diet and usefulness.

The American Medical Association has endorsed a campaign for the establishment of three homes for "old and financially insecure" physicians of this country. These will be established in the north, south and middle west.

But study alone is not enough; the ambitious man must think. If he is not succeeding, he takes account of himself and, by thinking, tries to find out what he can do to become successful, to get ahead. He analyzes his own situation; he tries to find out what is wrong; he seeks advice, but he depends upon himself and his own thinking. He can help himself in a way that no one else can help him.—Judge E. H. Gary, in Personal Efficiency, May, 1925.

It has been found that the time necessary for rats to mature can be reduced from approximately ninety days to sixty-seven days by selecting vigorous breeding stock and supplying foods rich in vitamins and protein. No doubt these factors are applicable to other animals and the saving of one-fourth of the maturing period in meat producing animals is of considerable economic importance provided the rapid development is not injurious to health.

Sound waves ranging in frequency from 100,000 to 400,000 vibrations per second have been demonstrated by Wood and Loomis. These waves lie two or three octaves above the highest note that can be heard by humans and are therefore soundless. These waves may be transmitted through air or water. The waves heat water as they pass through and destroy small fish. These soundless waves may be found to be of value as a therapeutic agent similar to the light rays that are beyond human vision.

Some outbreaks of roup, fowl cholera and fowl typhoid have been traced directly to infection spread by recently acquired birds. Such outbreaks can usually be prevented by effectual quarantine of recently acquired birds for a period of fifteen days.

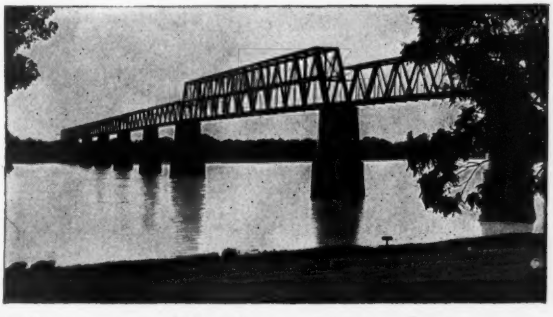
The cause of cancer is still unknown. It is known that a cancer is composed of rapidly growing and multiplying cells that are essentially embryonic in character. It has been demonstrated that tumors can be produced in chickens by the injection of filtered tumor juice and it has also been demonstrated that tumors can be produced in chickens by the injection of filtered juice of chick embryo and rat placenta. These facts are interesting and may be the forerunners of important discoveries.

STRYCHNIN POISON BAITS DO NOT HARM GAME BIRDS

The assumption that game birds may be killed by grain poisoned with strychnin and distributed to kill rodent pests has been found by the Biological Survey of the United States Department of Agriculture to be without foundation. Feeding tests have shown conclusively that the gallinaceous birds as a group, including quail, the prairie hen, sharp-tailed grouse, and sage grouse, possess a certain immunity from strychnin poisoning.

A striking test made several years ago in California, definitely proved that barley, poisoned according to the bureau's standard ground-squirrel formula in use in that state, had no effect on the abundance of the valley quail. These birds were plentiful and remained so in areas which were heavily poisoned. Not a single dead quail was found, nor were any observed showing symptoms of strychnin poisoning. Quail subsequently shot showed that they had been eating the barley to a limited extent. Some of the birds were captured and fed a poisoned mixture of barley. One adult quail ate 125 kernels of this poisoned barley in 24 hours with no sign of ill effects. This grain would have killed 12 ground squirrels.

More recent tests conducted substantiate the earlier experiments. Birds have eaten as much as 300 kernels of poisoned



Bridge over the Ohio River at Henderson, Ky., on the way to Lexington, where the A. V. M. A. meeting will be held, August 17, 18, 19, 20.

wheat without the slightest evidence of ill effect. They did, however, indicate a strong dislike for the poisoned grain. Grain poisoned to kill rabbits had no effect on sage hens feeding in great numbers in corn and bean fields in Wyoming. It seems evident, therefore, that fears for the safety of game birds from strychnin-poisoned baits are not well founded.

FIFTY THOUSAND DOLLARS FOR STUDY OF CONTAGIOUS ABORTION

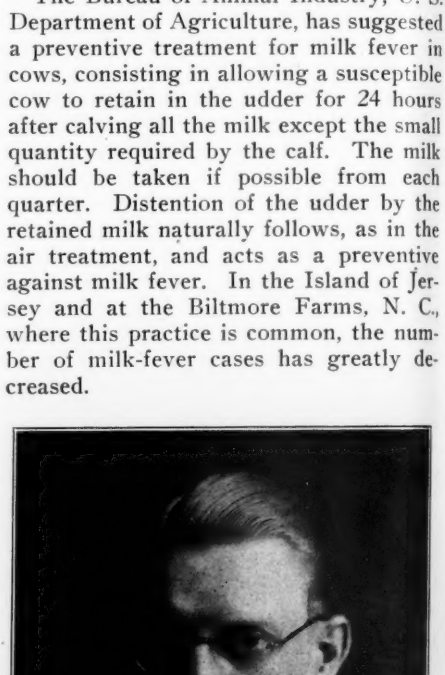
The Board of Regents of the University of Wisconsin has accepted a gift amounting to fifty thousand dollars from the Wisconsin Manufacturers' Association. This money is to be made available in installments of ten thousand dollars per annum for each of the five years following, for the purpose of studying the relation of nutrition to contagious abortion in cattle.

This new project is designed to determine whether or not there is any relationship between nutrition and the prevention or cure of contagious abortion. It is particularly fitting that the research work be conducted at the Wisconsin Agricultural Experiment Station, where experimental work with rations to determine their influence on growth and reproduction was started eighteen years ago, and where an experimental study of contagious abortion in cattle was undertaken fifteen years ago. The results secured from these projects have been published from time to time.

Dean F. B. Morrison, of the college, said in his report to the Board of Regents, "No matter which way the results come out, the investigation will be well worth while. If it can be proved that an adequate supply of minerals and vitamins will aid the farmers in reducing their losses from contagious abortion, the saving will be unmistakably large in Wisconsin and other dairy states."

The National Humane Review states that a veterinarian in a southern city who used to crop the ears of many dogs says he is losing from $75 to $100 a month as the result of the American Humane Association's campaign against cropping. People are not having their dogs cropped as they formerly did.

The Bureau of Animal Industry, U. S. Department of Agriculture, has suggested a preventive treatment for milk fever in cows, consisting in allowing a susceptible cow to retain in the udder for 24 hours after calving all the milk except the small quantity required by the calf. The milk should be taken if possible from each quarter. Distention of the udder by the retained milk naturally follows, as in the air treatment, and acts as a preventive against milk fever. In the Island of Jersey and at the Biltmore Farms, N. C., where this practice is common, the number of milk-fever cases has greatly decreased.



Dr. Robert Learmonth (Mich. '25), who recently established the Blue Cross Small Animal Clinic at Denver, Colo.

KANSAS STATE AGRICULTURAL COLLEGE JUL 3 1926 LIBRARY

Sterility in the Dairy Cow*

W. A. PARKER, Eureka, Mo.

SEVERAL YEARS AGO, about seven to be exact, I decided to become a sterility expert. I am still decided. After reading everything I could find on the subject and spending a good many hours on the killing floor at the packing house, I determined to make a little killing on my own hook. I mustered up my courage and started out to find some sterile cows. After a few days' search, a dairyman was located that had four. He had, as he said, bred these cows till the world looked level, and had just about given up hope. He was desperate and a deal was made whereby treatment of these four cows was to be undertaken and he was to pay $10.00 each for all those that had calves and nothing for those that did not. I was very fortunate and collected $40.00 within one year as all four had heifer calves, so the collecting was not a difficult job. If you ask what was done or how those cows were treated, I would not be able to tell you, but I presume the ovaries and uterus were massaged, for massage of these organs is important; at least, results have been obtained by this procedure and I never neglect the massage.

Four cows were treated and four cows had calves within a year—100%. What more does it take to make an expert? But, since that time results have fallen considerably below 100%, and whether or not the operator is at fault has not been decided. However, I am still plugging away and succeeding in more than 80% of those non-breeders. Probably a real expert could make the other 20% breed again.

Causes of Sterility

First, in importance among causes of sterility I will place atony of uterus and ovaries.

Second, cervicitis and vaginitis.

Third, cystic ovaries.

Fourth, metritis.

There are a few other causes of minor importance, but in my practice these four conditions predominate. Of the cases of sterility treated, 90% have been in dairy cows—about 75% of these have been Holsteins; 15% Jerseys; 6% Guernseys and the other 5% various breeds. It should be stated that if one expects to succeed in the diagnosis of ailments that cause sterility and in the diagnosis of pregnancy, first, learn thoroughly the normal generative organs.

Treatment

My treatment for atony of the uterus and ovaries is massage, and should a corpus luteum be encountered it should be expressed, provided the cow is not pregnant. A corpus luteum will feel like the half of a cherry laid on the ovary and is usually very readily removed. Grasp the ovary between the tips of the fingers and the ball of the thumb and massage it thoroughly and with pressure rupture any cysts that may be present.

It is very difficult to do any permanent damage to the ovaries by pressure through the walls of the rectum. Often you will encounter a very large, soft, flabby ovary that seems to go all to pieces under medium pressure, and on your next visit five or six days later, you will think some one has placed a new ovary where the old one was. Small, hard, atrophied ovaries should be treated with a very vigorous massage and it is surprising how they will respond. I like to give these cases about three treatments at five or six-day intervals for it stimulates internal secretion and tones up the ovaries and uterus and other internal glands that are connected with them and in general tones up the whole system.

In treating the uterus, give about 15 or 20 strokes from before backward with

* Presented at Missouri State Veterinary Medical Association meeting, St. Louis.

considerable pressure, having the body of the uterus and the horns between the palms of the fingers and the pelvic floor. This treatment should be given every five days for at least three treatments. Treatment should be repeated within a week as all the good done through massage will be accomplished in that length of time. In this way treatment can be completed in ten to twelve days and in nearly all cases this will be sufficient. This treatment is very efficient in cases that miss one or more heat periods, or in other words, come in heat irregularly. I am of the opinion that these cases conceive, carry the fertilized ovum over a heat period or two and from lack of tone in the uterus, expel it and again come in heat.

Cervicitis

This condition, as the word indicates, is an inflammation of the cervix and is found frequently and in varying degrees of intensity. It may include the uterine cervix as well as the vaginal cervix and the canal between the two and is often accompanied by a vaginitis of varying degrees. This vaginitis often reaches to the limits of the vaginal mucous membrane at the vulvar lips and is manifested by a very red or pink streaked appearance of the mucous membrane. When the cervical canal is involved, it will always be found open.

Treatment

In mild cases, a daily vaginal douche of a gallon of warm normal salt solution, will give good results. A one-half ounce capsule of boracic acid inserted in the vagina on alternate days also gives good results. Both treatments are effective. When the cervical canal is involved, it should be swabbed with a 50 per cent solution of iodin in water or Lugol's solution, being sure to reach the internal or uterine end of the cervix. This treatment should be repeated in ten days, meanwhile, having the salt solution douche given daily. This swabbing can be done very handily by attaching the long uterine forceps to the cervix and drawing it gently out between the lips of the vulva and holding a piece of clean dry cotton under the cervix to catch the overflow. For a swab I use a piece of cotton about one inch wide and four inches long held between the jaws of a slender 12-inch curved forceps. I find that the curved forceps follows the tortuous curved canal better than does a straight one. The severe cases of cervicitis often are accompanied by a cystic condition of the ovaries and both conditions can be treated at the same time. Many small protuberances or new growths encircling the external cervix may be found. These should be clipped off close with the curved scissors before the cervix is painted with iodin.

Cystic Ovaries

The treatment of this condition was discussed in connection with atony of the ovaries. The cysts should be ruptured every five or six days as long as they return and the ovaries massaged thoroughly. Should cysts that can not be ruptured by pressure be encountered, do not hesitate to puncture them with a narrow knife through the wall of the vagina, holding the ovary firmly against the wall of the vagina with the hand in the rectum.

Metritis

In my practice very few cases of metritis of a permanent nature have been found. Many cases of metritis occur following calving and especially where the placenta or part of it has been retained. The majority of these cases recover if gentle massage is applied once a week or every ten days. Resistant cases are treated by an injection of four to eight ounces of iodin or Lugol's solution directly into the uterus through a uterine catheter, using a fountain syringe with a short tube and plugging up the return flow in the catheter. Inserting the catheter opens the cervical canal and the contractions of the uterus following the injections expel the contents of the uterus in a few days. Contractions may also be stimulated by massage. Where a large amount of fluid pus is found in the uterus, it is well to wash it out clean once or twice with normal salt solution or a mild solution of chlorazene or Carrol-Dakin's

solution before the injection of iodin. In treating sterility we must not lose sight of the fact that nature is our greatest ally, and we must at least give her a chance to do her bit. Be persistent and do not try to do too much at one time, and if your first course of three or four treatments does not get results, don't give up; look for some disorder that may have been overlooked upon your first examination. If no additional or new trouble is found, just begin at the beginning and start all over again.

Nymphomania

The causes of nymphomania will not be discussed but it exists in a small percentage of dairy cows. Cervicitis and cystic ovaries are always present in these cases. Rupture of the ovarian cysts every five days as often as they occur, massage of the uterus, and painting or swabbing the cervix with iodin or Lugol's constitute a specific treatment.

The Bull as the Cause of Sterility in Cows

I have never encountered a case of sterility in a cow where the blame could be placed entirely on the bull if he was effective on the other cows in the herd, although there may be bulls that are not as effective on some cows as on others. A change of bulls in cases where they are at fault should be effective where all other things fail.

Diagnosis of Pregnancy

A cessation of heat periods is not always a safe diagnostic sign of pregnancy, though in some instances it is sufficient. The diagnosis of pregnancy by the novice or beginner should not be undertaken under ninety days following the last breeding date, though it is possible to detect a gravid uterus in 40 or 50 days. After about the fourth month the gravid uterus slips down over the anterior brim of the pelvis and can not be reached by rectal examination. The body of the uterus may be felt stretched rather tightly over the pelvic edge as a fibrous band one or two inches wide. An absence of the uterus lying on the floor of the pelvis is sufficient evidence that pregnancy has advanced beyond the fourth month. After six and one-half months the fetus may be plainly felt floating in its amniotic fluid. My safest guide for pregnancy is a dry or an adhesive or sticky condition of the mucous membrane of the cervix and anterior portion of the vagina. This condition exists after the pregnancy has advanced about sixty or eighty days. A finger placed on the gelatinous plug in the cervix and gradually withdrawn will cause the plug to follow the finger a certain distance.

Sterility in Heifers

There are two important causes of sterility in heifers. First, atony of uterus and ovaries. Second, the presence of a fibrous band of varying widths attached at both ends and reaching across the vagina laterally and covering the external cervix. Heifers affected in this way invariably conceive either the first or second breeding following the division of these bands.

Record of Cows Treated

Where the owner does not keep a card index system, the veterinarian should keep his own private record, either card index or in book form. I like the card index system. A record of this kind should consist of name of herd or owner, name of cow and ear tag number and date of birth, last calving date and history, last breeding date, regularity of estrum, date of examination, diagnosis, exact condition found, treatment, and date of next treatment, if any.

At the clinic of the Orange County Medical Society recently, Dr. J. B. Hulett, a surgeon of Middletown, N. Y., presented an unusually interesting case. A man 52 years old, a fireman on a railroad, had spleen trouble. The doctor removed the patient's spleen in October, 1925. It was enormously enlarged, measuring six inches one way. The man made a complete recovery, is shoveling coal every day and seems well and hearty. To me this certainly recalls the question, "What is the function of the spleen?"—J. F. DeVine.

Difficult Parturition

E. T. BAKER, Moscow, Idaho

IN THE PAST SEVENTEEN YEARS, we have been called to attend over 450 cases of dystocia. Of these, some 300 have been in the cow; about 50 in the mare, and the majority of the balance in ewes.

We have delivered monstrosities and have failed in some. We have seen dystocia followed by eversion of the uterus, eclampsia, punctured bladder and intestines, ruptured uterus and vagina, peritonitis, paralysis, milk fever, septicemia, recovery and death. We have observed cases get well that should by all symptoms succumb, and others die without giving any satisfactory excuse for shuffling off!

Several times a year we run across cases that baffle us, and others have been saved by pure, unadulterated luck, so that we do not claim to be a world beater, by any means. We happen to be an average country practitioner, who often has to adopt rough and ready tactics where more refined and scientific methods would result in a first class funeral. Then again, with no help except from the owner, we must conserve our energies, for often we get a run of dystocia that almost paralyzes our arms for several days. We have had four bad cases occur within two days, and not another one for several weeks.

We have gained many helpful pointers from the writings of Dr. DeVine, and we believe that he possesses almost human intelligence when discussing veterinary obstetrics.

This article, therefore, is merely a description of how we handle our dystocia cases, and makes no pretense of being an ultra-scientific thesis, for we have forgotten most of the terms used in textbooks. However, we notice that we are more successful in securing the fetus when we can determine the presentation, and that since adopting our present routine for obstetric cases we have far better luck than formerly.

The stock owner does not give a whoop for scientific theories but he does appreciate success in handling obstetric cases. When you can deliver a live colt or calf, and the mother does well, it makes a great hit with him. When you get the colt or calf and later the mother dies, due to no fault of yours, the owner still thinks you are a great man. When you fail to secure the colt or calf, no matter whether it is impossible or not, his estimation of you falls several notches.

Another thing, we have tried to educate our clients to call us in time. We tell our stock owning friends that when a cow tries to give birth to a calf for several hours without success to call in a veterinarian at once. We also tell them that night calls are more expensive, and we have noticed less of these in late years. Last year we were called to a ranch where a "born expert" had worked on the case for some hours. The cow had twins, and he had one foot of each fetus. We examined the cow, and luckily found out what was the matter by feeling two tails. We repelled the twins, and then got one at a time. We did not "bawl out" the expert, but quietly told him afterwards what he had done. He returned the favor by turning all the obstetrical work in his neighborhood to us.

We remember one case in particular that happened some ten years ago. A very religious family found a young mare trying to foal one Sunday morning, and, being anxious to get to church, they turned her out in the barnyard, where a small creek ran through. When they returned home, they found the mare down in the creek, with the head of the fetus protruding. Trying to pull it out with main strength and awkwardness, they failed, and then hitched a log chain

around its neck, and brought out a team. After dragging the mare ten or fifteen feet, they succeeded in pulling the colt out. A complete eversion of the uterus now took place, but thinking it would return of its own free will and accord, they washed up and went in to dinner, where the saintly head of the family returned thanks to a merciful God! While at dinner a couple of sows wandered by and began eating the protruded uterus, and when the consecrated family came out, they found the mare in a semi-conscious condition due to the loss of blood.

About this time, a brilliant idea came to them to call me, and when we found out the complete history, we charged them twenty dollars for relieving the poor animal from her suffering. Cases like this used to be rather common some years ago, for the western pioneer was a hardy cuss, and even a lot of women died in childbirth through neglect and ignorance. Fortunately, conditions are better now. Modern hospitals are found in almost every town, and people have learned the value of getting expert assistance in time.

Every practitioner can do a lot of missionary work along this line, and while it may not do much good among agricultural college graduates who imagine themselves experts after inhaling a six-hour course in obstetrics, it will help the common or garden variety of stock owner!

With more and more dairy stock, we find we have dystocia cases throughout the year. While May is still our banner month, yet the autumn furnishes us with a lot of work, and even all months now supply a case or two.

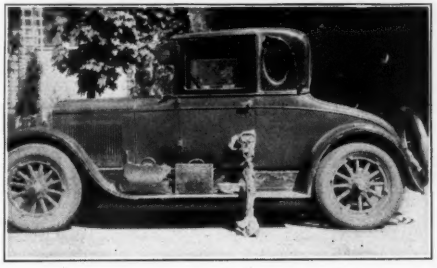
We should certainly like to read articles along this line written by men with practical experience, for we all have our little handy "wrinkles" that perhaps no one else has thought of.

Formerly, we used to dread obstetric cases. In the first place our equipment was inadequate; in the second instance, we were afraid to "wade right in," and delayed too long for a successful delivery, and finally, we tried to follow textbook theories too closely. Now, we would rather tackle three cases of dystocia than one ordinary equine impaction.

Equipment

First of all, a practitioner needs a car with plenty of grip space. Personally, we prefer the roadster type, for then our outfit is kept dustproof and out of the way. While there are many good cars on the market, our fourth Buick coupe is giving us excellent satisfaction.

Experience has taught us that few obstetric instruments are needed, except an oiled suit, 30-inch chains, wire stretcher, and a good right arm. We used our hooks and repeller just once last year, and once in a while an embryotomy knife will come in handy. About 95 per cent of the obstetric instruments are made to

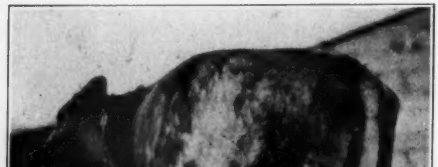


Our obstetric outfit on the running board.

sell, and Dr. Williams, in his valuable work on "Veterinary Obstetrics" gives some sound advice along this line. An instrument salesman who could persuade an experienced practitioner to purchase one of these jointed handled toy sets could sell bathing suits to an Eskimo!

My obstetrical grip is an 18-inch bag with side pockets for the common drugs used in these cases. We have five four-ounce bottles (with screw caps) of aseptogen, campho-phenique or lubricating antiseptic, chloral, potassium permanganate and aromatic spirits of ammonia. In the other side pocket we carry a large bottle of powdered boric acid and a few uterine capsules. Any of the capsules put out by the various commercial houses are good, but they should have small slits

in them, so that the contents will dissolve before the patient dies of old age. We have a No. 3 Tower Fish Brand oiled suit that we have used for ten years. One can hose this off after using, sprinkle a little aromatic antiseptic over it, hang it



Bloat is common in cows about to calve, due to gastro-intestinal stasis.

up to dry, and it will last a long time. We also have an old woolen shirt without sleeves, a spool of wire and a large needle for sutures in the vulva in case of an obstinate eversion, a small bottle of pituitary solution, embryotomy knife, vulsellum forceps, small pig forceps and a two-ounce bottle of equal parts of tincture of iodin and ether to pour on our hands in case we get a small cut from the fetus.

The obstetric roll contains six home-made instruments consisting of blunt hook, sharp hook, repeller, chisel, each thirty-six inches long over all, with big, roomy handles four inches deep and five inches wide, so that several hands can grasp them. Then we have a small blunt hook and sharp hook, to which is attached some sash cord. Jut what good these latter are has never yet been determined by the writer.

Our third grip is a small but expensive suit case costing ninety-eight cents. It is thirteen inches long and ten wide. It contains four 30-inch obstetric chains, three halter chains with two double snaps each, a wire stretcher, and a small roll of sash cord.

As an extra precaution we always carry an additional wire stretcher, two lariats and small rope or two to fit in the stretcher. A farmer never has a stretcher that works, a lantern that is not smoky or a butcher knife that will cut, and usually all the ropes are over at the other place.

Then, of course, we have our injection pump and hose, our surgical grip and emergency bag in the car. We also carry a good flashlight and a washpan. We have been threatening for the past ten years to carry along a bottle of liquid soap, but so far have neglected to do so.

Preliminary Operations

When we reach the scene, we first make a rapid survey of the field of battle and see what we will have to do. If it is a cow and she refuses to get up, we make arrangements to raise her hind parts and slip under her hips a box, bale of hay, barrel or an old door. This is where our lariats come in handy, and perhaps a good hoist would be useful.

Then we give her a dose of medicine. This is a general stimulant, laxative and carminative. We like an ounce each of sodium hyposulphite and sodium chlorid dissolved in a pint of warm water. To this is added two rumen tablets (with one-fourth grain strychnin each) and a dram or two of cascara and ginger. We give the medicine first so that when all is over, the cow can be fed and she will usually eat.

We get our wire stretcher attached to some post or tree, and with the aid of our halter chains, distance is no object. We fill our bucket or washpan with warm water to which is added some aseptogen, therapogen or any other aromatic antiseptic, and immerse our chains. Slipping into our old shirt, oiled suit, with both arms well lubricated, we station our help at advantageous positions. We have grandpa look after the head and halter rope. We have the owner at the stretcher, and if one of the neighbors is present we have him stand on the left side so he can

help us and sit on the animal's left flank to prevent too much straining. Having everything ready, we make our preliminary examination. If we find the fetus all twisted up and the mother strains too much, we give her an ounce of chloral as a drench or per rectum.

Delivery

Having our patient in a position for raising the hind parts when we desire, cuts down the work to a minimum. The operator who allows a cow or mare to lie stretched out on her side on the floor or ground and tries to correct a mal-presentation is a lot fonder of muscular exercise than we are. With the hind parts raised, and a husky man sitting on the left flank, we are able to repel the fetus between strains, and often correct the head or legs in a few minutes.

By having made all necessary arrangements in advance, and being in a position to work fast, is one of the secrets of successful obstetrical operations.

Another thing, if you feel sure that the fetus is too large to deliver alive, tell the owner the best thing to do is to disembowel it, in order to save the mother. Young Holsteins bred to a large sire often have this trouble.

"Is it comin' head first?" is the question always asked. We always give an evasive answer, for often a front leg stretched by a great tension feels like the hock of the hind limb. Being able to repel the fetus between strains helps a lot to determine the position, and after that has been done, the rest of the operation is much simplified.

We use wire stretchers for the reason that the tension is more even than by hand power, and that with chains, the fetus is not injured. In fact, tugging and twisting and allowing the fetus to remain half way out in a suffocating position is what kills it.

Two "wrinkles" have helped us a great deal when all other methods have failed. Pull one leg out at a time, for when both are pulled at once, the pelvic outlet is apt to be jammed. Secondly, when everything is corrected, and the fetus still jams at the shoulders or hips, lower the mother and get her on her back, stretching both hind legs.

In a ewe, we use the same routine. Head her into a corner; have a man on each side, with their hands forming a bridge under her belly. Adjust your stretchers; gradually work in your lubricated hand, and pretty soon you will feel a lamb wedged against the pelvic outlet. Sometimes it is part way out, but usually not. Have your horny handed assistants raise the ewe up on her hind toes, and repel the fetus between strains. Then try to get a foot or the head, and slip a chain over it, and pull on it steadily if adjusted.

After Treatment

If the calf is alive, we do not clean the cow, as this usually occurs in a couple of hours, and she does much better.

Douching often causes more harm than good, and unless the case is a putrid one, we prefer slipping in a capsule or some powdered boric acid, and then leaving her strictly alone.

A cow usually refuses to get up.

Learn to observe the first symptoms of eversion and you will save a lot of grief. Differentiate eclamptic symptoms from milk fever, and simple paralysis from oncoming death.

Always be guarded in your prognosis, because the patient may die getting well. Leave some medicine with the owner to

administer several times daily, as this makes him think he is doing something for his country.

Be clean; be as gentle as you can; work fast when you begin; do not play yourself out on preliminary operations; study each case and try to figure out how you can improve on your present technic. Then charge a good, reasonable fee, and you will find the handling of dystocia cases as easy as any other operation requiring muscle and headwork.

Necrotic Stomatitis of Calves (Calf Diphtheria)

WM. PAYTON, Savonburg, Kansas

NECROTIC STOMATITIS is a contagious, infectious disease of suckling calves, in which there develop on the buccal mucous membrane croupous diphtheritic patches and ulcers, and it is usually attended with a general toxemia which leads to death.

The disease is very common in Europe, and serious outbreaks have been seen in the United States, more particularly in Colorado, Wyoming, South Dakota, Iowa, Kansas and Southwest Texas.

Etiology

The cause of the disease is the Bacillus necrophorus, a thin, long rod which forms in the tissues and in artificial media in slender undulated filaments.

Natural infection probably comes from the calves getting straw or litter contaminated with necrosis bacilli. Healthy calves in contact with diseased ones are infected by licking the sick ones or picking up feed that is contaminated with the discharge from the nose and mouth of the affected animal. The disease is very easily transmitted, spreading from calf to calf in the manner described. Very young calves, from three to five days old, become affected where there is a general outbreak.

Symptoms

The period of incubation is from three to five days. As I have seen very young calves most often attacked, the first symptoms observed are languor and disinclination to suck. There soon develop a drooling from the mouth, a discharge from the nose and a slight increase in temperature. On examination of the mouth, which is very painful to the patient, areas of redness and erosion are revealed on the mucous membrane of the cheeks, tongue, hard palate and fauces. These areas represent patches of yellow ulcers from the size of a pea to that of a five-cent piece and some even larger. The necrotic mass is very adherent to the underlying tissue and can be removed only with difficulty. These ulcers may involve the muscle tissue. The disease may affect the nasal cavity and produce a yellow, greenish, sticky discharge which adheres to the border of the nostrils, and occasionally the nose is obstructed by the accumulation of exudate, causing difficulty in breathing. If the larynx and trachea are involved, there will be a cough and labored breathing. Besides the local symptoms, there is a general toxemia shown by loss of appetite, languor, weakness and a temperature sometimes as high as 105° F.

Postmortem Findings

On postmortem examination, the mucous membrane of the mouth and throat shows areas dirty gray in color, irregular in form and well circumscribed. They are frequently found on the cheeks and borders of the tongue, also involving the upper respiratory passages and occasionally the intestinal canal. In some cases

large surfaces of mucous membrane are covered with a yellowish gray, fetid, cheesy mass. Sometimes the lungs are infected, showing a pneumonic condition, or there may be a gangrenous condition. Occasionally there may be pleuritis. In most cases the small intestines are catarrhally inflamed and dotted with caseous deposits. The spleen is normal. The lymph glands are swollen.

Diagnosis

Diagnosis is not difficult and depends on the fact that in this disease well marked necrotic areas and ulcers occur on the mucous membrane in the regions mentioned. In no other disease of calves are these deposits so well marked. I might mention that I was called a short time ago to treat a calf with this disease, which was well marked, and I informed the owner that other animals would be affected. On the fourth day following, I was called to see another calf with the same disease. As there was a rabies scare in the neighborhood, the owner called another veterinarian, who diagnosed the case as rabies. I treated the animal for a week when it became so weak and prostrated that it died. I held a postmortem examination on one of these calves and laboratory diagnosis confirmed my findings. So let us be guarded in our diagnosis.

Course and Prognosis

The disease if left to itself leads to death in from five to eight days. Some animals may live as long as three weeks and die of pneumonia. Cases that recover do so gradually, convalescence lasting for weeks as healing of the ulcers is extremely slow.

Affected calves if left to themselves usually die, or if they recover they remain stunted in growth. If proper treatment is given early, most of them recover, healing requiring about two weeks.

Treatment

This consists in thorough cleaning and disinfecting the mouth cavity with a two-per-cent solution of creolin or a five-per-cent solution of potassium permanganate in warm water, either with a swab or syringe. The patches may be curetted as deeply as feasible and then painted with tincture of iodin or Lugol's solution. The calf should be fed liquid food and raw eggs, two to three eggs, three times daily. Plenty of cold water should be kept within reach.

The sick calves should be isolated. The mouths of exposed calves should be examined once each day for lesions. All litter in exposed pens and barns should be burned and the places disinfected with a two-per-cent solution of creolin or liquor cresolis compositus, as it is understood that the Bacillus necrophorus will live a long time in barns and sheds where there is no sunlight.

The causative agent of infantile paralysis may, according to Aycock be transmitted through milk or other indirect methods.

Avian tuberculosis has been found quite widespread in Kansas. Infected flocks have been found from the eastern border to the extreme western part of the state.

Cleansing by hot water and soap is of value not only in actually washing away infection, but also actually destroying some pathogenic bacteria.

Chicks are most susceptible to parasitic infestation, particularly the round worms the first three months after hatching. Improper feeding and unthriftiness are an important predisposing factor to parasitism in chickens.

Chemical activity manifested by color reactions of various juices and fluids is superior in females. Thus, it is possible, in the majority of cases to detect sex by color reactions. Has this color reaction any relation to the use of rouge and lip stick?

Sporotrichosis

IN THE JUNE 5TH NUMBER of the Journal of the American Medical Association, Ralph M. Carter, M. D., Green Bay, Wis., contributes an article on sporotrichosis in man with reports of two cases. Since this disease also occurs in animals, the following excerpts from the paper may be of interest to veterinarians.

"Sporotrichosis, recognized as a definite entity, is a disease of comparatively recent date, the first case having been reported in America by Schenk in 1898. This was followed in 1900 by the report of another case by Hektoen and Perkins. In 1903, de Beurmann's original report dealing with French cases appeared. Following this, cases began to be reported from all over the civilized world, and the literature of the subject grew rapidly. In 1912, Hamburger stated that more than 200 cases were on record at the time, and since then many additional ones have been reported.

"While the disease usually appears as a cutaneous manifestation, it is by no means confined to the skin structures, and apparently no part of the body is exempt. The frequency with which the skin is attacked is probably accounted for by the usual mode of infection, as a result of minor peripheral traumas. According to de Beurmann, four clinical varieties of the disease may be recognized.

"1. A localized cutaneous form, with a definite primary lesion, or sporotrichotic chancre, together with an ascending lymphangitis and local lymphadenitis.

"2. A disseminated, gummatous form. In this variety, multiple subcutaneous nodules appear, distributed throughout the body without systematic arrangement; in the early stage, these consist of small, hard, round, painless masses; later they soften to form large and small soft cold abscesses. A distinguishing feature is the fact that there is no ulceration.

"3. A disseminated ulcerative sporotrichosis. This is characterized by multiple polymorphic ulcerations resembling tuberculous, syphilitic, ecthymatous, rupial or furuncular lesions, or a mixture of these.

"4. Sporotrichosis affecting the extracutaneous tissues. In these cases, localization may be in the mucous membranes, bones, joints, ocular tissues, muscles, synovial membranes, kidneys, lungs or other viscera or tissues.

"The disease is due to infection with Sporotrichum, a fungus. When the condition first began to be studied, it was believed that different manifestations were due to different varieties of the organism, and various strains were described. Later investigations, however, seem to have established the identity of all these as S. schenkii, the morphologic differences formerly noted as characteristic of different varieties all appearing at different ages of S. schenkii, as mentioned by Taylor.

"In certain parts of the United States, especially Pennsylvania, Ohio, Indiana, Iowa, Nebraska and North and South Dakota, spontaneous sporotrichosis of domestic animals, particularly horses, is very common. From the same districts, numerous cases of human infection have also been reported, and it has been definitely determined by Meyer that the infecting organisms in the equine and human types are identical. In spite of this fact, it seems to be fairly well established that contact infection from animals to man is very rare.

"The fungus seems to have a rather wide distribution in nature, being present especially on shrubbery and grain stalks. Several cases of infection have occurred from the handling of rotten logs and stumps, when new land is being cleared.

"The organism is practically never found in the pus from discharging abscesses; cultures from these abscesses are likewise unsatisfactory. It is readily grown, however, from pus obtained by aspiration from an unopened nodule.

"The disease may occur at any age, but the majority of the cases reported are in adults, undoubtedly because this is the time of greatest manual activity, with consequent greater likelihood of infection. For the same reason, more men acquire it than women. Cases are more numerous among farmers, fruit and vegetable dealers, berry pickers and florists.

"In the ordinary cutaneous form, which is most frequently encountered, infection usually follows a trivial trauma, such as a scratch from a nail or wire, a knife cut, or a prick from a thorn or stalk of grain. Cases are reported following the bite of a rat or hen. The period of incubation is slow and the onset insidious; more and more nodules form, following the course of the lymphatics; the clinical course is slow and long drawn out; there is no pain or fever, and no effect on the general health. Occasionally, the deeper structures such as the tendon sheaths, and even the bones may be attacked; or a sporotrichotic septicemia may occur, with multiple gummatous lesions of the skin and viscera.

"The treatment is simple, and consists in administering increasing doses of a saturated solution of potassium iodid. Local applications of iodin (Lugol's solution) may hasten the disappearance of the primary lesion. Under this management, the patients all recover."

The Etiology of Milk Fever

J. T. EDWARDS, B. Sc., M. R. C. V. S.
Director, Imperial Institute of Veterinary Research, Muktesar, India

IN A RECENT ISSUE of The Veterinary Record (1926, January, Vol. 6. No. 3, pp. 52-53) there appeared a short article on the above subject by Mr. L. C. Maguire, F. R. C. V. S., which, in the light of subsequent information that has just come to my notice, must be regarded as containing a presumably independent announcement of singular importance. After discussing the theories emitted within the last two years by certain British writers upon the etiology of milk fever, Mr. Maguire argues that the symptoms of the condition can be correlated with those of a hypoglycemia and furnishes illustrations from his clinical practice pointing to the restoration of the depressed sugar content of the blood to the normal in a comatose animal treated by air insufflation of the udder and also to the cure of an affected animal, likewise found to be suffering from hypoglycemia, by the intravenous injection of glucose. Mr. Maguire concludes his note by asking the question: "The one thing I am still doubtful about is—What is the factor which brings about the sudden excessive output of insulin into the animal's system?"

Curiously, in a technical journal that has just come to hand (The Journal of Laboratory and Clinical Medicine, St. Louis, Mo., U. S. A., 1926, January, Vol. xi., No. 4, pp. 400-401) there appears an editorial note that would seem to dissipate definitely Mr. Maguire's perplexities, by Professor J. J. R. Macleod, M. B., the distinguished physiologist of the School of Medicine of the University of Toronto, and leader of the team of workers who isolated the product named insulin now employed in such striking manner in the treatment of diabetes in the human subject. It would appear from the note that the symptoms of milk fever are actually attributable to a hypoglycemia, which is brought about, however, not by a sudden excessive output of insulin into the animal's system, but by a sudden "removal of glucose from the maternal organism to furnish the lactose of the milk" at the commencement of lacta-

tion following upon parturition. Thus:—

"A depancreatized female dog, kept alive by daily injections of insulin and feeding with raw pancreas and sugar, became pregnant and gave birth to five pups. At various intervals during the pregnancy careful observations were made (by W. W. Simpson) of the carbohydrate balance, without finding that any change occurred. As has been pointed out in a previous editorial, this result does not support the view held by some, that the growing fetus can secrete sufficient insulin into the maternal organism to prevent the full development of diabetic symptoms when the pancreas is removed. But a fact of still greater significance observed in this animal, was that marked symptoms of hypoglycemia developed on the day following parturition, the cause for which was obviously the removal of glucose from the maternal organism to furnish the lactose of the milk. When this observation was made (January 2nd, 1925), we failed to realize that it gave the clue to the cause of milk fever in cattle, a fact which has been clearly established through the work of Widmark and Carlens. In the first paper describing their work, these authors show that the blood sugar of normal cows while not giving milk is 0.085 per cent, but that it falls to a level very near that at which hypoglycemic symptoms supervene (0.040 per cent.) when the animals are being used for milking. A parallelism could also be demonstrated between the height of the blood sugar and the amount of milk which each animal yielded. Subsequently they found that the administration of insulin to normal cows caused the blood sugar to fall to below 0.040 per cent, when symptoms identical with those observed in milk fever supervened; namely, a gradually developing paralysis which ultimately became so severe that the animal collapsed, and although for some time after falling it attempted to raise its head, this finally ceased, and the animal lay limp and helpless on its side.

"The treatment for this condition obviously demands restoration of the blood sugar, and it is significant that this is what occurs when the orthodox veterinary practice of blowing air into the udder is followed. Widmark and Carlens found, in confirmation of earlier work by Paul Bert and Porchet, that this operation causes a prompt rise in blood sugar in lactating animals, most pronounced in those giving the richest yields of milk, and of only slight degree in poor milkers. This operation causes mechanical interference with the activity of the secretory cells of the gland, so that they fail to take up glucose from the blood. During the active secretion there is no doubt that amounts of glucose are being carried to the glands which are in excess of those present when no lactation is occurring; the sudden interference with the functioning of the cells then causes glucose to accumulate in the blood until a sufficient concentration is present to act as an inhibitory stimulus to the glycogenolytic mechanism, and so shuts down the supply of blood sugar. That such a regulatory mechanism does come into play is indicated by the fact that the hyperglycemia following air injection is only temporary, the normal level of blood sugar being regained in about two hours."—The Veterinary Record.

In Public Health Reports, No. 17, of April 23rd, appears an article on the influence of vitamin deficiencies on susceptibility to certain poisons. A study was made of the toxicity of a number of pharmacologic agents in vitamin-deficient rats. Increased susceptibility to pilocarpin and ergotoxin was observed in vitamin B deficient animals. Rats on vitamin A deficient diet showed a much lowered resistance to ergotoxin and to morphin. Definite though slight increase in susceptibility was also noted to histamin, ouabain, and to the alkaloids strychnin, atropin, cocain and apocodein.

Losses of Pigs due to Rickets (Rachitis)

A. T. KINSLEY, Kansas City, Mo.

RICKETS IS A DISEASE characterized by diminished calcification in the bones. This condition exacts rather a heavy toll from swine breeders in certain locations. It is more prevalent some years than others. Single cases may occur on premises, but it is not unusual for from 5 to 40 per cent of the entire pig crop to become affected. On one farm on which 500 pigs were farrowed in the spring of 1922, 300 of them developed rickets. The disease is more prevalent some seasons than others.

This condition is sometimes confused with paralysis; in fact, some veterinarians report this condition as posterior paralysis. It is essentially a disease of the young growing pig and occurs in all breeds of swine. Rickets is of considerable economic importance to the swine producer because the losses incident to its ravages are relatively large. The disease does not kill promptly but it causes unthriftiness and the affected pigs do not develop, thus the returns from the sale of the pig crop is diminished.

It is possible that rickets may be more prevalent in the large type hogs, and according to some breeders it is more common in certain families or strains.

Cause

Rickets is due to disturbance in metabolism. Predisposing factors such as inbreeding, improper feeding, and insanitary surroundings, no doubt, influence the occurrence of the disease. Rickets has been produced experimentally in pigs that were kept in closed, covered pens, thus prohibiting sunshine although they were provided a balanced ration. Rickets is a condition in which there is insufficient calcium deposited in the developing bones, and the condition is more prevalent in those communities in which there is a deficiency of lime in the soil and in the food stuff. Another very important factor in the normal calcification of osseous tissue is vitamin D. Thus, it has been shown that there may be an abundance of calcium salts in feed but it is not properly utilized without ample quantities of vitamin D.

From the information available at this time, it may be tentatively assured that the occurrence of rickets is dependent upon three factors, absence of sunshine, insufficient calcium salts and lack of vitamin D in the feed. The essential portion of sunshine in prohibiting the development of rickets is the violet-rays. These rays may be reflected in skyshine but the principal source is direct sunshine. The exact relationship of violet rays, vitamin D, and calcium salts in the occurrence of rickets is an interesting problem. Recent experiments appear to indicate that the available lime salts in feeds depend not only upon the lime content of the soil on which the feed was grown but also on the amount of sunshine during the growing season.

Symptoms

Rickets is usually manifested in the beginning by weakness, depraved appetite, lameness and diarrhea in some cases. The characteristic symptoms of rickets are disturbed locomotion succeeded by bending or arching of the long bones of the legs. At this stage the lying posture is almost continuously assumed. When such animals are helped to their feet they may not support their weight with their hind legs, although some of them will walk around in the lot on their front feet dragging their hind quarters. In some few instances the affected pig may have use of the hind legs but not the front legs. In these cases the condition is apparently not paralysis; at least, the affected portions retain sensitiveness and the failure to use the parts is due to pain. The affected animals will evince pain

by grunting and squealing when made to move, and they may walk on their toes or carpal joints. Nervous disturbances evidenced by dizziness, somnolence and convulsions may occur. As the disease progresses enlargements of the epiphyses become evident appearing as swollen articulations. Bony enlargements may occur elsewhere. There may be disturbed respiration due to bulging of the bones of the front legs and pressure upon the ribs. The vertebral column may be variously curved upward, downward or laterally.

Various symptoms are prone to occur in the latter stages of this disease due to disturbances of digestion, respiration and other vital functions. Thus thumping, coughing and diarrhea are common.

Diagnosis

This malady is essentially of a chronic nature and continues for months unless death intervenes early, which is exceptional. After the changes in the bones have occurred diagnosis should not be difficult. Rickets can be differentiated from articular rheumatism by the shifting lameness that characterizes the latter malady. Osseous tuberculosis can be differentiated from rickets by the application of the tuberculin test. Paralysis due to perineuritis usually occurs in mature hogs or at least hogs weighing 150 pounds or more and can be differentiated from rickets which is most common in shotes or pigs weighing less than 50 pounds.

Lesions

The lesions of rickets are primarily confined to osseous tissue and occur most frequently in the long bones of the legs. Other bones may be involved. The affected bones are enlarged, soft, and spongy. The epiphyses of the long bones are usually enlarged and irregularly club-shaped, and the shaft is usually irregularly thickened and arched. The subperiosteal bony tissue is usually spongy. The marrow is red in color and is of a gelatinous consistency. The articular surfaces, particularly of the long bones, may be ulcerated. The flat bones of the pelvis and cranium may be affected and the nose and mouth may be practically obliterated by the enlarged rarefied surrounding bones. The teeth may appear deep set because of the tumefaction of the alveolar tissue. In long standing cases it is not unusual for the enlarged rarefied bones to become relatively dense and more or less deformed.

Various other lesions may be found in advanced cases of rickets and are evidence of complications.

Treatment

The treatment of swine in the early stages of rickets is advisable, but pigs in the advanced stages of the disease should be destroyed. The affected swine should be placed in sanitary quarters in which there will be an abundance of sunshine, and provided a ration that is known to contain ample quantities of vitamin D and calcium phosphate, such as milk and alfalfa hay. Calcium can be provided as bone meal, prepared chalk or lime water. Cod-liver-oil is a valuable food and facilitates the utilization of calcium and should be prescribed in the food in quantities ranging from four drams to two ounces twice daily. Radiation with violet rays will probably give splendid results where the price of such treatment is justifiable.

Rickets can be properly classified as a preventable disease. The proper care and management, particularly the application of rational breeding methods, the proper feeding of the breeding stock, and the infant pigs, and the provision of sanitary quarters with an abundance of sunshine, will practically eliminate pig losses from rachitis.

Some poultrymen claim the ravages incident to white diarrhea can be diminished by keeping the chicks in darkness for the first three or four days excepting during feeding time. This is contrary to the belief that light and especially sunshine is beneficial.

Sanitation in the Control of Swine Diseases*

L. VAN ES, Lincoln, Nebraska

IN VIEW OF THE FACT that it is only three years since the speaker had the privilege of presenting the subject of sanitation in connection with swine growing to this organization, it does not seem necessary to dwell again on this subject at great length.

In the previous discussion, attention was called to the great mortality of young pigs in certain sections of the country due to diseases which were designated as "filth born." It was pointed out that polluted soil played a very important part in the transmission of those diseases and that the abandonment of old hog lots and the rotation of pastures, as already prescribed by our lamented friend Ransom in connection with certain worm troubles, are prophylactic measures of the greatest importance with reference to the diseases mentioned. The importance of a clean water supply and sanitary feeding methods was also emphasized. None of those details requires to be repeated on this occasion.

It may be fitting, however, to again view the importance of sanitary management of swine in the light of more recently acquired knowledge and impressions. For so far as actual knowledge is concerned, there can be no doubt of the great damage done to young pigs by intestinal diseases associated with paratyphoid or suipestifer infections.

This type of pig diseases along with so-called "bull nose" and intestinal helminthiases are most readily prevented by means of sanitary methods which assure a clean uncontaminated soil and an unpolluted water and food supply.

On many of the nearly 200 Nebraska farms where a more or less complete system of sanitary management is being carried out, the results were often striking, and in practically all cases the method enabled the farmer to raise a thrifty, healthy pig crop, while during the years immediately preceding, when the old haphazard methods prevailed, his death losses were great, and his surviving pigs were commonly runty and unprofitable. It appears also that even on farms where a recognized disease problem had not yet presented itself, the pigs raised under sanitary control are apt to be more vigorous and more profitable to the owner than the ones which had grown up under the archaic conditions of former years.

The damage done by intestinal worms must, of course, be granted. This can also be effectively prevented by the sanitary practices to which reference has already been made. The pig ascarid, however, presents another aspect which gives it a certain sanitary importance, paradoxical as the statement may seem. The statement refers particularly to the fact that the ascarid of the pig may be regarded as a valuable gauge to the sanitary fitness of an environment for young pigs.

When pigs or shotes are conspicuously wormy, the fact indicates in a most certain manner that something is wrong in a sanitary sense. The indications should be especially valuable to the farmer who may not be in a position to suspect a pig typhoid infection for a long time, and who may have some difficulty to connect this disease and the one he calls "bull-nose" with fecal contaminations of his yards. He, on the other hand, knows worms when he sees them; in fact, they are one of his pet worries and he can more rapidly understand the reason of their being

* From Proceedings of the Twenty-ninth Annual Meeting of the U. S. Live Stock Sanitary Association, held at Chicago, December 2-4, 1925.

there once the problem is explained to him.

In our observations during the last three years, no evidence was encountered which tended to show that the occurrence of "flu" and hog cholera was prevented by sanitary practices. It may be, however, that in a more indirect manner the hog cholera mortality may be favorably influenced by a more sanitary management of our swine herds. During recent years we have so commonly observed that so-called vaccination breaks frequently occur in herds which show a marked paratyphoid morbidity, and there may be some reason to suspect a connection between those factors and that in a pig affected with any form of pig typhoid; it may be more difficult to establish a solid immunity than in one in a normal state of health. This observation is merely an empirical one, but while awaiting the accumulation of more substantial evidence, it may be given weight in a plea for the more general adoption of sanitary practices in the management of swine.

Since the discussion of the subject of sanitation three years ago, we have learned much in regard to the more prolific sources of swine tuberculosis.

The fact that the preponderating number of swine retained on account of tuberculosis obtained their infection through contact with tuberculous poultry flocks, and the further fact that avian tuberculosis is largely soil born, make it obvious that in the control of swine tuberculosis the adoption of sanitary methods of management is destined to play an important part.

Owing to the feeding habits of swine and the alimentary origin of many of their diseases, the pollution of their food and water, and the substances with which the latter comes in contact, stand out preeminently as the environmental fault especially to be guarded against. This is the object of what has previously been described as sanitation. At the present time its practice in a large area of the swine growing section has acquired the same importance as anti-hog-cholera vaccination. Prompt and intelligent attention to both cannot help but be greatly instrumental in removing a large part of the hog disease incubus which weighs so heavily on many producers.

"The thrift, daily gains and feed required to make 100 pounds of gain were practically the same when pigs were fed on the ground as when they were fed on a concrete feeding floor, indicating that if a bit of caution is exercised in scattering the corn a concrete feeding floor is not necessary for summer feeding of pigs under average Kansas conditions."—Circular 112, Agr. Exp. Sta., Kans. No doubt, the foregoing quotation is correct but will the requisites provided be executed even on Kansa. farms? If the hog lots and feeding beds are changed frequently, no doubt the method of feeding advised will be successful, but the expense of a concrete feeding floor is negligible in comparison to the loss of feed and parasitic disorders that are incident to the usual "ground feeding."

Man's association with animals has left its trace not only in literature, but in such prosaic objects as coins as well. Legend tells of an ancient capitalist of Lydia named Geges, who came to Sardis to collect a debt. Cattle being the money in those days, the debtor pointed to a brindle ox and told Geges to write out a receipt. Unfortunately the ox died and Geges decided he had been given "a bum steer," so he introduced a bill in the Lydian legislature providing for a coinage of tokens to represent the value of cattle. For ages the cow was the chief standard of value, the Latin word for money "pecunia" being derived from "pecus," cattle. In time when gold money came into use, there were the "ox talents" with the head of an ox on one side.

KANSAS STATE AGRICULTURAL COLLEGE
JUL 3 1926
329
LIBRARY

Cocain Substitutes for Local Anesthesia*

CAPTAIN C. M. COWHERD, V. C.

Butyn

THROUGH THE COURTESY of the Abbott Laboratories, North Chicago, Illinois, a supply of butyn, 2 per cent solution and a package of butyn and epinephrin compound hypodermic tablets, were furnished to the station veterinarian, Fort Sam Houston, for experimental use. Following is a list of cases in which the writer used these products as a cocain substitute in producing local anesthesia:

Hospital Case No. 351. Verruca, right shoulder, removed May 31, 1924, using 10 cc. of a 1 per cent solution of butyn and epinephrin. Operation was started ten minutes after injection, but anesthesia was not complete so the operation was deferred until fifteen minutes after injection when the anesthesia was satisfactory.

Hospital Case No. 427. Melanosarcoma, tail, lower third. Amputation of tail, lower third, performed June 17, 1924. Anesthetic 30 cc. of a ½ per cent solution of butyn and epinephrin. Complete anesthesia 10 minutes after injection.

Hospital Case No. 434. Verruca, superior third, right shoulder, removed June 18, 1924. Anesthetic 2 cc. of a ½ per cent solution of butyn and epinephrin. Complete anesthesia 10 minutes after injection.

Hospital Case No. 454. Empyema left maxillary sinus following removal of fifth upper molar. Trephining of left superior maxillary sinus for irrigation and drainage performed August 21, 1924. Anesthetic 10 cc. of a ½ per cent solution of butyn and epinephrin, preceded by 15 cc. Cannabis Americana by the mouth 45 minutes before operation. Results very satisfactory.

Hospital Case No. 504. Fibroma, right elbow, posterior border, following acute bursitis removed July 24, 1924. Anesthetic 10 cc. of a ½ per cent solution of butyn and epinephrin administered locally ten minutes preceding operation and 15 cc. Cannabis Americana by the mouth 40 minutes before operation. Anesthesia complete.

Hospital Case No. 690. Abscess, right lateral surface, middle third back, following contusion caused by saddle. Thick fibrous capsule of abscess removed September 18, 1924. Anesthetic ½ per cent solution of butyn and epinephrin. Operation performed 10 minutes after injection. Results satisfactory.

Hospital Case No. 659. Verruca, right elbow, external surface, removed September 9, 1924. Anesthetic ½ per cent solution of butyn and epinephrin 10 minutes before operation, and 15 cc. of Cannabis Americana by the mouth one hour before operation. Anesthesia complete.

Hospital Case No. 710. Fibroma, breast, middle third, removed September 27, 1924. Anesthetic 10 cc. of a ½ per cent solution of butyn with epinephrin 10 minutes before operation and 20 cc. of Cannabis Americana by the mouth one hour before operation. Anesthesia complete.

Hospital Case No. 770. Fibroma, breast, middle third, following abscess, removed October 30, 1924. Anesthetic ½ per cent solution of butyn, 10 minutes before operation and Cannabis Americana by the mouth 45 minutes before operation. Anesthesia complete.

Hospital Case No. 730. Fibroma, left forearm, removed October 24, 1924. Anesthetic 10 cc. of a ½ per cent solution of butyn and epinephrin administered 10

* Report on butyn published in the Sept. 9, 1925, number and report on procain in the May 12, 1926, number of the Veterinary Bulletin, U. S. Army.

minutes before operation and 15 cc. of Cannabis Americana by the mouth 45 minutes before operation. Anesthesia complete.

A sheep belonging to the laboratory, 8th Corps Area, became infested with Lucillia macellaria in the left eye in which the sight was already lost. Enucleation of eyeball performed November 10, 1924. Anesthetic 2 per cent solution of butyn instilled in eye and ½ per cent solution injected into eyeball. Anesthesia very satisfactory.

Having had such satisfactory results in the above cases, I am of the opinion that butyn is in every way equally as efficacious as cocain for local anesthesia and that it possesses the following advantages over cocain:

1. It is more powerful, requiring less than half as much, and local anesthesia is more rapidly obtained and prolonged for a greater period of time.
2. In the quantity required and in solution of the proper strength (1/10 per cent to 1 per cent) it is much less toxic. (No toxic effect whatever was noticed in any of the cases in which I have used it.)
3. It does not produce the ischemic effect, nor the irritating, drying or shrinking effect upon the tissues, and for this reason it does not tend to retard wound healing.
4. It is not a mydriatic. When instilled in the eye the size of the pupil remains unchanged.
5. It may be boiled without impairment of anesthetic action. However, if combined with epinephrin, the latter becomes less efficacious if boiling is prolonged. The anesthetic efficiency of cocain is seriously impaired, if not entirely lost, by boiling.
6. It is not subject to the Harrison Narcotic Act, and it does not require the rigid measures for its safekeeping that are necessary for cocain.

Technic suggested in using butyn:

Butyn solutions should be made with distilled water, as it is precipitated by any aqueous saline solution. It will dissolve more rapidly if water is hot. Whether for instillation or injection, for surface or infiltration anesthesia, the technic generally advised for administration of cocain is also applicable to butyn.

The first and most important step for infiltration anesthesia is the establishment of an insensitive wheal in the skin completely surrounding the line of incision. This is attained by injecting the solution intracutaneously. From the insensitive wheal in the skin, the deeper injections may be made as desired. Pushing the plunger of the syringe as the needle is inserted will keep the anesthetic in advance of the needle and thus make the administration painless.

I find that the administration of a narcotic in connection with the use of local anesthesia is advantageous, especially if the animal is one of a nervous and irritable temperament. If the animal has been well narcotized, it will resist restraint but very little, which is not only more pleasant to the operator but is also conducive to the safety and comfort of the patient. Cannabis Indica or Americana appears to be more desirable than chloral hydrate for this purpose, as it is more easily and safely administered. A dose of 15 to 20 cc. of the fluid extract by the mouth given 45 minutes to one hour before operation is quite satisfactory.

Procain

Since submitting my preliminary report of cocain substitutes for local anesthesia (butyn), I have used procain in several surgical cases at the Veterinary Station Hospital, Fort Sam Houston, Texas, with the following results:

1. Hospital Case No. 900. Mule affected with a fibroma, anterior third, right lateral surface abdomen; the tumor being about three inches in diameter. The growth was removed on January 5, 1925, without apparent pain or discomfort to the animal. Anesthetic 10 cc. of 2 per cent solution procain administered by infiltration and preceded one hour by 15 cc. fluid extract Cannabis Americana by the mouth.

2. Hospital Case No. 7. Horse affected with a fibroma, 2½ inches in diameter, left costal region, removed on January 9, 1925. Anesthetic 15 cc. of 2 per cent solution procain, preceded one hour by 15 cc. Cannabis. Excellent results.

3. Hospital Case No. 13. Mule with verruca 2½ inches in diameter, posterior third, right lateral surface abdomen, removed on January 10, 1925. Anesthetic 10 cc. of 2 per cent solution procain, preceded by 15 cc. fluid extract Cannabis. Anesthesia complete.

4. Hospital Case No. 19. Mule with a history of frequent epistaxis, left nostril (tumor in maxillary sinus suspected). Trephining of the left superior maxillary sinus was performed on February 3, 1925, using 10 cc. of 2 per cent solution procain, preceded by Cannabis. No evidence of pain.

5. Hospital Case No. 106. Horse with scirrhous cord 5 inches in length and an average diameter of about 3 inches. The tumor with the affected portion of the cord was dissected and removed on February 8, 1925. Anesthetic 30 cc. of 2 per cent solution procain, preceded by 15 cc. fluid extract Cannabis. This tumor extended almost to the external inguinal ring with the usual mass of adhesions, but its removal caused no pain whatever.

6. Hospital Case No. 255. Horse with fibroma (shoe boil) 3 inches in diameter, posterior border left elbow, removed on May 9, 1925, using 10 cc. of 2 per cent solution of procain preceded by Cannabis. Results satisfactory.

7. Hospital Case No. 583. Horse affected with verruca of penis involving the glans and urethral process. Amputation of three inches of the penis was performed on November 3, 1925, using 20 cc. of 2 per cent procain, preceded by 15 cc. fluid extract Cannabis. In connection with this operation some surgeons are of the opinion that only profound general anesthesia is sufficient. Merillat's second edition, Vol. III, Veterinary Surgical Operations, page 406, reads as follows: "Restraint: The operation requires dorsal recumbent restraint and profound anesthesia. Local anesthesia is insufficient, and to attempt the operation without any effort to prevent pain is both cruel and dangerous from fatal shock." The technic used by me in this operation was to dissect the urethra from the body of the penis for a distance of three inches. An ecraseur was then placed over the body of the penis, thus amputating it. The urethral process being involved, I removed about one-half inch of the urethra with the scissors; the remaining two and one-half inches which had been dissected from the body of the penis was left intact to prevent stricture. This patient did not exhibit any sign of shock following the operation and the wound healed very rapidly. The excess portion of the urethra sloughed off, and as yet no evidence of stricture or other complication has appeared.

8. Hospital Case No. 757. Horse with fibroma (shoe boil), posterior border right elbow. Removed on November 24, 1925, using procain locally and Cannabis by the mouth. Results satisfactory.

9 and 10. Unauthorized private mounts with scirrhous cords. The tumors were about three inches in diameter and extended within one inch of the external inguinal ring, but like case No. 5, these tumors were removed without pain by the use of procain and Cannabis.

11. Unauthorized private mount affected with a fibroma about one inch in diameter inside of left cheek. Removed on September 28, 1925, using procain alone with very good results.

12. Dog with fractures involving first, second and third phalanges, fifth digit, left hind foot, infection following. The affected bones were dissected and removed on December 1, 1925, without the least discomfort to the animal. Anesthetic, 2 per cent solution procain only.

In the above cases, I administered procain in the same manner as that in which I used butyn described in my preliminary report, and the very satisfactory results obtained prompts me to point out its su-

periority over cocain for the following reasons:

Being much less toxic than cocain, it can be used liberally with little or no danger, either local or general. None of the patients reported herein exhibited the slightest evidence of toxic effect incident to the use of procain, although in some cases as much as 30 cc. of a 2 per cent solution was used. The operative wounds have all healed nicely. Attention is invited to case No. 10, a colt eighteen months old and weighing about 500 pounds, on which I used 30 cc. of a 2 per cent solution of procain without the slightest toxic effect. On account of the fear of the toxic effect sometimes obtained in the use of cocain, it is often so sparingly used that the full anesthetic effect so much desired is not obtained.

Procain is not subject to the regulation of the Harrison Narcotic Act and therefore does not require the drastic measures for its safekeeping that are necessary for habit-forming drugs. Proper facilities are not always available for the proper storage of cocain and other narcotics subject to the regulations of the Harrison Act. In fact, no facilities are available for their safekeeping in the field and even if they were, it is a waste of time to write a prescription, file same, open an iron safe, dispense a grain or two of cocain, and make the entries in the narcotic register, every time a local anesthetic is desired. This extra work can be eliminated by substituting procain for cocain.

Procain may be boiled to sterilize the solution without impairing its anesthetic efficiency. Cocain if boiled loses most, if not all, of its anesthetic action.

For topical use I do not believe that procain is as effective as cocain, as I have experimentally instilled a few drops in the eyes of dogs and obtained but little anesthetic effect. I am of the opinion, however, that many of the operations about the eyes could be performed with procain administered by infiltration. While procain may be inferior to cocain for topical use, butyn appears to be superior to cocain as it does not dilate the pupil.

In connection with local anesthetics, whether cocain, butyn, procain, or other such agents are used, the results are more satisfactory if the patient is given a narcotic about forty-five minutes or one hour preceding the time of the operation. The purpose of the narcotic is to cause the animal to yield more readily to restraint and to allay all excitement incident thereto. Of course, in the case of gentle animals and if the field of operation is such that no restraint is required, the narcotic is not necessary providing the local anesthetic is skillfully administered. As a narcotic for this purpose, either chloral hydrate (3 gms. per 100 pounds weight of animal) or fluid extract Cannabis (1½ cc. per 100 pounds weight) may be used. I prefer the Cannabis as it is more easily administered than chloral hydrate and is also safer on account of the irritating effect of the latter in case of a capsule being broken during administration. It has been my experience that a more pronounced narcotic effect is obtained from Cannabis when given in a capsule than by diluting it and giving with a syringe.

Using a narcotic in connection with local anesthesia seems to give a much wider field of use for the latter, especially if the anesthetic used is one that is but slightly toxic. It certainly is more easily used and with greater safety to the patient than either chloroform or ether. Chloroform and ether cannot be used with safety unless highly trained assistants are available as it is almost impossible for the surgeon to give any considerable attention to a general anesthetic while engaged in a difficult operation. Operations performed in the field can, if the nature of the operation will permit, be much more easily performed with local anesthesia than with general anesthesia, and here the use of a narcotic is particularly useful.

I desire to recommend that butyn and procain be added to the Veterinary Supply Table and that cocain be removed therefrom. It is especially desirable that

cocain be removed from the list of items carried in the field and that something suitable be substituted.

It is my intention to continue the use of butyn and procain and to record so far as possible the advantages and disadvantages of each. Should I find anything that may be of interest in this connection, I will submit a third report for publication in the Bulletin.

Note: Since the preparation of this article by Captain Cowherd a veterinary allowance of procain has been added to the Medical Department Equipment and Allowance Table, effective July 1, 1926. Procain hydrochlorid in one ounce bottles can be found in this table under item number 13810 and in 2½ grain hypodermic tablets, 10 in tube, under item number 13830.

Infectious Diseases of Poultry of New Importance

M. E. GOUGE, D. V. S., Sedalia, Mo.

THERE ARE CERTAIN DISEASES of poultry that I believe have been with us for a long time, but they have manifested such increased activity in the last few years that we are prone to look upon them as new troubles.

As to what these diseases are, or their methods of control, I will make no attempt to enlighten you. My approach to them is simply from the viewpoint of a practitioner and I regard them as one of the greatest problems facing the veterinary profession today. Without a doubt, these infectious diseases threaten the ruin of the whole poultry industry.

My attention was first called to the seriousness of poultry diseases about a year and a half ago, or about the time of the embargo by certain eastern states on account of the European fowl plague. A large poultry packing plant asked my assistance in handling a disease which was causing them tremendous losses.

After making such investigation as the facilities at my disposal permitted, including the holding of many autopsies, I concluded that while there appeared to be several diseases present in the flock, there was really only a single one manifested by different symptoms.

Some had swollen heads and eyes, similar to the condition in roup; in others, the infection was chiefly respiratory, exhibiting mouth breathing, sneezing and noticeable abdominal respiration such as is seen in a horse affected with heaves. A few had diarrhea and other symptoms resembling cholera. Postmortem examination often showed cheesy masses in the roof of the mouth and in the nasal sinuses. The trachea was almost occluded, by a thick mucous exudate. Petechial spots showed on the liver and on the base of the heart. Occasional fine hemorrhages were to be found in the lungs, and in the cases having diarrhea, in the intestines also.

The poultry packing plants depend upon the gain obtained by forced feeding for their profits. Because of the presence of this disease, they found it impossible to feed their usual seven-day period. The gain under normal conditions for this period is two per cent a day, or a total of 14 per cent. Owing to the presence of this disease, this gain dropped to five or six per cent. They cut the feeding period to five days and commenced rejecting birds at the door when brought in from the country or smaller houses. The rejections soon amounted to 10 to 16 per cent, which of course, resulted in much dissatisfaction on the part of the sellers.

Following this, all visibly sick birds

were taken from the feeding batteries daily and sent to the slaughtering room. At the end of the feeding period of five days, 54 per cent had been withdrawn and slaughtered. I presume that the experience of other packing plants would not vary much from the experience of this one, so, we would be safe in saying at least 50 per cent of all the birds killed and packed in over a year, were sick when killed. Perhaps to this should be added the 16 per cent of sick ones rejected at the door, as these were probably slaughtered in smaller establishments or by the owner.

Conditions improved in midwinter, but continued very serious. Just recently, the trouble has increased and is now raging with its former fury. The gains at this packing plant have dropped from 14 per cent to 5 per cent and in appearance, the disease is more virulent than ever.

For a number of years, a client of mine had hauled the offal from this poultry house and scattered it upon his farm. It has been impossible for him to handle calves, swine or sheep on this farm without immunizing them against hemorrhagic septicemia. About three years ago, he moved to another farm and stocked it and soon began hauling the offal to this new farm. In a short time, hemorrhagic septicemia again broke out among his stock, and in one day and night, he lost five yearling Jersey heifers out of a herd of eight. Vaccination stopped it.

My opinion is based purely upon clinical experience, that the causative agent for all of these troubles, both in the poultry and the other farm animals, is the same organism, the germ of hemorrhagic septicemia. I know that the statement will be contradicted by many, but my opinion, based upon the observations related here and many others of a similar nature, is that under proper conditions, hemorrhagic septicemia can be transmitted from calves to sheep, and from sheep to hogs, and from hogs to calves, and from any of these animals to poultry, and vice versa.

The reason for the increased virulence of poultry diseases at this time I attribute to the present method of raising chickens. A large percentage of the chicks are now hatched in large hatcheries and at one day old, are shipped all over the country, exposed to all unfavorable weather conditions imaginable at the weakest period in a bird's life. This results in a very low vitality, which repeated generation after generation, has lowered the vitality of a large percentage of the poultry in the country to a point where the birds are unable to withstand the diseases that under normal conditions had little effect on them.

This history is the same with the other domestic animals. As they become more and more domesticated, new infectious diseases are continuously springing up. We have been able to combat these conditions successfully only by raising the individual resistance of the animal by some form of vaccination. This, I believe, is what we shall have to do in the matter of the poultry diseases so devastating at present. In this, we are confronted with so many complications that it is going to be the hardest task the veterinary profession has yet faced.

In conclusion, I wish to emphasize the need of poultry inspection at all poultry packing houses. I see no other way in which the poultry consumers have any guarantee of a wholesome product or can avoid having 50 per cent of the poultry consumed sick when it is slaughtered.

The agglutinating property or power of the pneumococcus is, according to Falk, Jacobson and Gussin an indication of its pathogenicity. These investigators assumed that agglutination was determined by electric voltage between the pneumococcus and suspension fluid and they devised an ingenious method of measuring the same. Thus, by this test these investigators have made it possible to give a rather accurate prognosis in the early stages of pneumonia.

Hypodermoclysis in Canine Practice

J. G. HORNING and A. J. McKEE, Houston, Texas

HYPODERMOCLYSIS: The introduction into the subcutaneous tissues of fluids, especially physiologic salt solution, in large quantity (Dorland).

It is used chiefly in cases that are badly dehydrated, after hemorrhage, in acidosis, marasmus, and in active diarrhea. The solution used is physiologic saline solution prepared by dissolving eight tablets of Abbott's physiologic saline tablets in one quart of water and boiling for five minutes. For acidosis pure bicarbonate of soda solution is employed alone or with 4 per cent of dextrose.

The amount given depends upon the case and patient.

Pups and dogs weighing from 1 to 5 pounds, 2 to 4 ounces.

Pups and dogs weighing from 5 to 10 pounds, 4 to 6 ounces.

Pups and dogs weighing from 10 to 15 pounds, 6 to 8 ounces.

Pups and dogs weighing from 15 to 20 pounds, 8 to 12 ounces.

Pups and dogs weighing from 20 to 30 pounds, 12 to 16 ounces.

Pups and dogs weighing from 30 to 50 pounds, 16 to 24 ounces.

To pups and dogs over fifty pounds, give about four ounces to every additional ten pounds of body weight.

The number of times given depends strictly upon the case. In the majority of cases, you will have to give only once or twice. The way we test if necessary to repeat is by noting the time the body requires to absorb the saline solution. By this we mean if there is complete absorption of the amount injected in less than one hour, we know that it will be necessary to repeat the hypodermoclysis in four hours; if there is a complete absorption in two hours, we repeat the injection in twelve hours; if there is a complete absorption in three hours and not before, we usually test out with a small drink of

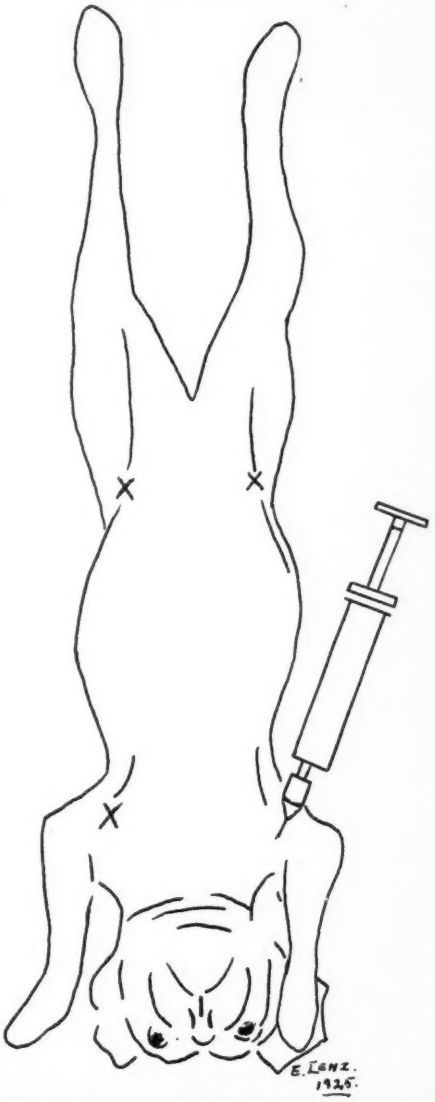


Fig. 1

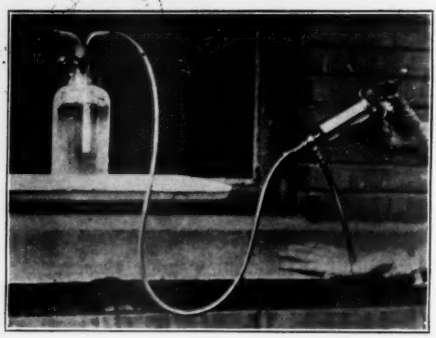


Fig. 2

water and if it is held without vomiting, we again give a drink in a few more minutes allowing the dog to lap a fair amount; if this is held we again give another drink in a few minutes, and if this is held we allow the dog to drink all the water he wants.

Dehydrated cases where there is extreme nausea respond splendidly to this treatment. The results have been so good in the treatment of all cases mentioned that we have decided to again write it up presenting with pictures so that our technic would be more clear.

Figure 1 shows the sites for injection. In our first administrations of this, we used a large hypodermic syringe and it was indeed a laborious job. However, we have rigged up an aspirating syringe as illustrated in Figure 2 and the solution can be given easily and quickly. Should the pressure of the solution cause too much pain to the patient, this can be eliminated by the addition of Butyn or Novocain to the solution when next injected. As to syringes we believe the Shikles Bros. syringe that they use for hog cholera serum would be equally as good if not better.

We clean the sites of injection thoroughly and wash with lysol solution and biniodid soap, dry with cotton and then again wash with alcohol, insert the needle under the skin at places marked in Figure 1, and try to inject the amount in four parts. The syringe is washed with alcohol by placing the tube in the alcohol bottle and pumping through; it is then pumped dry and rewashed with saline solution before the needle is inserted under skin, making sure that all air is out of the syringe.

The technic given is simple, and the results are so good that we feel confident if it is given a fair trial it will shortly come into common use by the small animal practitioner as a standby in hospital practice.

Fig. 3. A case of marasmus, a progressive wasting and emaciation where there is no obvious cause. One observes the same clinical picture in advanced stages of hookworm infestation and other types of dehydration. The condition often responds to treatment by hypodermoclysis.

The specific toxic substance of the loco plant has not been identified. However, it is known to be cumulative and habit forming. The only definite method of avoiding loco poisoning is to prevent animals from eating the plant. These plants can be eradicated by repeatedly cutting the plant root about two inches below the soil surface.

Pigs from sows that have ample exercise during the gestation period develop more rapidly than pigs from sows that have insufficient exercise. This is apparently in accord with the farmer's idea that mares that are given ordinary work will produce stronger and better developed foals than mares that are not worked.

ALABAMA STATE AGRICULTURAL COLLEGE JUL 3 1926 LIBRARY

Autotoxemia, Worms and Fright Disease of Dogs

G. W. BROWNING, Mobile, Ala.

AT THE MEETING of the Alabama State Optical Association held in Mobile recently, one of the members said that ninety per cent of the diseases of the human race originated from the shoulders up. Then comes along the orificial surgeon and says that ninety per cent originates in the lower orifices of the body. The chiropractor is certain he is right that practically all diseases are due to some defect in the spinal column. Another class believe that ninety per cent of the diseases have their origin in the stomach, and I am rather inclined to place myself in this class.

I shall now proceed to give the cause of the great American ailment, "fright disease" in dogs. It usually starts at weaning time due to improper feeding, causing indigestion and fermentation with the accumulation of a large amount of mucus in the stomach, in which internal parasites grow and thrive, producing an acid toxemia or autointoxication. This I regard as the exciting cause, plus worms, distemper and excitement as the predisposing causes.

I doubt if there is another disease that has given the veterinarian as much worry as this disease has, especially the Southern practitioner.

Treatment

Our first procedure should be to stop the spasms or running fits as they are sometimes called. For this I have yet to find a remedy to equal lobelin sulphate used in doses large enough to produce emesis. This puts the stomach in condition to retain, absorb and assimilate the other indicated remedies.

If distemper is a complication, it should be treated by the proper antipyretics or febrifuges, but unless one wants a funeral, all heart depressants such as antipyrin, aspirin, etc., should be avoided; in fact, all of the coal tar synthetics should be avoided in this depressing disease. As a fever medicine indicated in most cases of distemper, I have found the following prescription to answer admirably:

℞

Specific tincture serpentaria	ʒ iss
Specific tincture cimicifuga	ʒ i
Specific tincture byronia	M xv
Elixir lactopepsin q. s.	ʒ iv

M.

Sig: teaspoonful every three hours.

If there are no worms present but indigestion with gastralgia, use the following:

℞

Specific tincture dioscorea	ʒ i
Specific tincure colocynth	M xv
Spirits lavender comp.	ʒ ii
Aqua q. s.	ʒ iv

M.

Sig: teaspoonful every hour until free from pain.

However, if worms are present, one should try to get rid of them. The reader will please permit me to introduce a little homily at this point. It has not been so very long ago since one of the wisest in his own mind and one at that time looked upon as an authority said that there could not exist in the human body more worms than was good for the body, that they were there to eat up the filth in the body and should be allowed to remain there for that purpose. I am not of the class who believe every animal has worms, nor of the opposite school who believe no animal has them, or if present they amount to nothing. However, I do believe that a large quantity of mucus is

necessary to their existence. In fact, I am inclined to believe that internal worms like their relatives outside subsist and flourish best in materials that are in process of decay or putrefaction. Hence, I look upon their presence as a sign of indigestion, fermentation or some other deficiency in the functions of the stomach or bowels, and once in possession they must be expelled, for no improvement in diet or general health will entirely get rid of them.

There are four species of worms that infest the alimentary tract of the dog, two for cats and two or three for foxes. However, my greatest experience has been in the eradication or control of worm infestation in the dog, so I shall confine most of my remarks to this animal.

Treatment should first be preventive by the use of sanitary measures and proper feeding. The kennels should be kept clean and well disinfected and the suckling mother cleansed by washing and brushing. If this is not done, all our best vermifuges will accomplish nothing. Therefore, the main object is to stop the source of the infestation, and by feeding a liberal meat diet, increase the animal's resistance to the few parasites that our best vermicides will leave in the body.

An experience of over a quarter of a century in treating dogs for worms and the number of postmortem examinations I have held during this period, have convinced me that, under the ordinary unsanitary conditions of most dog kennels, there are at least two species of worms or parasites that the dog is never rid of after a heavy infestation, regardless of what remedy is used. I refer to the hookworm and the tapeworm, Dipylidium caninum.

I am frank to state that I believe we have worried entirely too much in the past over the supposed ravages of the hookworm. It is not like most other internal parasites. It does not live off the food in the stomach as does the roundworm but is a blood-sucker, attaching itself to the mucous coat of the small intestines in practically the same manner as the bot attaches itself to the mucous membrane of the stomach of the horse.

We are all aware of the number of horses that were killed in former years, and still are, by dosing with strong medicines for the hypothetical "bot disease." Now, let us take warning from the experience we have had with bots in horses. I think we are all pretty well satisfied that any remedy that will kill the bots in the horse will kill the horse first, and my experience has been that any remedy that will kill the hookworm in the alimentary tract of the dog, cat or fox and keep the parasite killed, will kill the animal first.

As I gave my treatment for worms in the May number of Veterinary Medicine, I shall not repeat it. The profession has about settled down on two remedies, and I shall without knocking these drugs, give some of their ultimate effects. The drugs I have reference to are oil of chenopodium and carbon tetrachlorid.

I am not doubting their ability to remove worms, for I know they will, but what else will they do? We shall take oil of chenopodium in large doses. It first produces gastro-enteritis with congestion of the mucous membrane followed by fatal hemorrhage and death. If the animal survives this heavy dose, he will be deaf the rest of his life. I don't say that this happens every time it is given, but it happens oftener than we should like to see it and might be classed as an instance where the cure is worse than the disease.

For instance, one of your clients has a very fine pointer puppy that is the apple of his eye, and he is expecting great things from the dog when the fall hunting season comes. He brings the puppy to you to have it wormed. You use the favorite anthelmintic or vermicide, oil of chenopodium, and the worms are eliminated. But behold! in the course of a week or so, the owner discovers his puppy is deaf. Well, you say he will eventually get over it. Does he? I have seen quite a number of cases of this kind in this vicinity, and I don't know of one that has gotten over it. They may, but as far as

I have been able to find out, they have not in this neck of the woods.

Carbon tetrachlorid, unless it produces asphyxia by a capsule being broken in the mouth, runs a more chronic course than does oil of chenopodium, producing necrosis of the liver, which is a serious thing. As we all know, the liver in addition to secreting bile acts as a destroyer of poisons coming through the portal vein from the intestinal tract, and if this sure worm-getter puts the liver in such a diseased condition that it cannot perform this function, it surely is not a safe remedy for continuous use, and any remedy to keep the animal anything like clear of worms must be given continuously.

I have used one remedy for hookworms that seems to do the work without any particular harm to the patient or any bad after effects. That is oil of rue. The dose is from five to thirty drops in a capsule; in fact, it is given the same as oil of chenopodium. The principal objection to this preparation is its disagreeable odor. Like with iodoform, they know where you have been. The efficiency of this oil depends a great deal on getting a good preparation, as I find there is a vast difference in the potency of the drug. To be sure I am getting a good article, I get the one put up by Fritzsche Bros., New York, obtaining it through my wholesale druggist.

Coursing Hounds with Special Reference to the Greyhound*

E. J. FRICK, Manhattan, Kans.

EVERY DOG HAS HIS DAY and this is dog's day. The American people have gone to the dogs! The dog industry in the United States represents a value of approximately $100,000,000, based upon an estimate of about ten million dogs and upon the capital invested in supplies, food, and remedies. Thousands of persons are engaged in breeding and selling dogs. About four hundred shows are held each year and almost 800 dog clubs are in existence in the United States today. There are a dozen magazines published monthly devoted to the dog and hundreds of books shelve our knowledge of the canine. The dog has a very distinct value. It may be a pedigreed breeding value, a practical worth, such as driving cattle, herding sheep, hunting or watchdog purpose, or merely a sentimental value as a lap dog for milady. I have been asked to talk to you on coursing hounds with especial reference to the greyhound. The following breeds are ordinarily classed as coursing hounds (or dogs that depend on their sight rather than nose when hunting):

1. Scottish deerhound.
2. Irish wolfhound.
3. Russian wolfhound.
4. Whippet.
5. Greyhound.

The Scottish deerhound, common companion to the Highland chief, is used for hunting deer and other scottish game. The color is usually a blue-grey or brindle, weight 85 to 105 pounds dog and 65 to 80 pounds bitch. Height about 26 to 30 inches. His coat is best described as intermediate between silk and wool.

2. The Irish wolfhound is the largest of all dogs and was known to Romans and Norwegians who invaded Ireland in early times. They were bred and used for hunting the great Irish elk, wolves, and deer. The standard for this great canine is a medium height of 30 inches and at least 120 pounds.

3. The Russian wolfhound, Borzoi or

* Presented before the Colorado Veterinary Medical Association, Ft. Collins, May 24th.

Psovoi, as he is sometimes called, is used in Russia for wolf hunting. Horsemen slip a pair of these fast hounds when the wolf is sighted and well trained dogs will rush upon each side of the wolf and pin him by the neck just behind the ears and hold him until the horsemen arrive. The average height is 26 to 28 inches with a weight of 75 to 100 pounds. They are very aristocratic looking animals but ferocious fighters.

4. The whippet is really a miniature greyhound. The origin was probably obtained by a cross between the small Italian greyhound and the white English terrier. The breed was first started by colliers and working men in North England where it was used for rabbit coursing. A law passed preventing the killing of rabbits caused the people to develop straight track running. Whippets are keen little sportsmen. A whippet race is exciting and interesting. The dogs are held in leash at a given mark by an attendant while some other person at the other end of the track shakes a handkerchief at the dogs to attract their attention. There is an official starter and the dogs are liberated at the shot of a pistol and immediately dash for the handkerchief. The usual course is 200 yards and the dogs are handicapped depending on weight and sex. The females are usually faster and handicapped one yard The heavier dog is faster and handicapped three yards per pound. The best weight is about 20 pounds. A good whippet covers 200 yards in 12 to 15 seconds. This is about twice as fast as a human dash man.

The dog I wish to consider more in detail is the greyhound. The greyhound is the breed of dog of which we can find the earliest mention. Seven hundred years before Christ we find in Solomon's Proverbs, Chapter 30, verses 29-31, the following (pardon me for quoting scripture, but you know I am far from home): "There be three things which go well, yea four are comely in going; A lion, which is strongest among beasts and turneth not away for any; a greyhound; and a he-goat also; and a king against whom there is no rising up." Then again 1800 years ago we find carved on stone by Flavius Arrianus, "The true sportsman does not take out his dogs to destroy the hares but for the sake of the course and the contest between the dogs and the hares and is glad if the hare escapes."

Appreciation of the ability of greyhounds is therefore nothing new. Greyhounds have the most perfect form for speed that probably ever existed among domestic animals. This wonderful example of extreme specialism of breeding cannot be equaled for speed, courage, and endurance by any other animal. Careful timing by a popular scientific magazine showed the greyhound capable of doing 35 miles an hour for a short time and exceeds the racehorse, prong-horned antelope, hare, and jackrabbit in the order named. There are two separate breeds of greyhound, the English and the Italian.

The English is the one used for coursing in England, Ireland, Australia and America and is the one I shall consider. He is much larger than the Italian. The Italian is small and resembles a whippet. His only use is as a toy dog for he is frail and does not have any, shall I say, intestinal stamina.

The English greyhound is large but no regular size or weight is considered for coursing; perhaps an average of 60 to 70 pounds is considered the most useful. Color is also immaterial, as like a good horse, if he is fast enough he cannot be a bad color.

Greyhound coursing is a popular, interesting, and above all, exceptionally clean sport when properly managed. There are three general types of coursing:

1. Open country coursing.
2. Electric track.
3. Closed coursing with live rabbits.

1. The open coursing consists of taking a pair of greyhounds afield and when a rabbit is scared up the dogs are freed to catch it if they can.

2. The electric track is an enclosed park with a stuffed bunny operated elec-

trically that runs before the dogs to test their skill. Electric tracks are business propositions. That they are popular can be judged when I say that the ones at New Orleans, La., Miami, St. Petersburg, Tampa, and Sarasota, Florida, and Erlanger, Kentucky, have purses of $1000 a night. Some have been running one hundred nights this winter and the one at St. Petersburg has paid out $500,000 this winter for prize money. Is it any wonder there were over 1500 greyhounds at one time the past season at the five principal tracks? Two thousand greyhounds were used for coursing on electric tracks this past season. Needless to say there is betting at these races.

On the way to the coursing grounds.

The closed coursing is best described as follows: The coursing meet is usually held in a park 500 yards long and 200 yards wide, fenced off with burlap about three feet high. Jackrabbits trained to dash from one end of the field to their quarters at the other end are used. A man known as the slipper holds the two contesting greyhounds on a special leash that frees both dogs at once. These dogs are hardened and finished for racing weeks before the meet. They have a detailed system of training and are wiped, sponged, and blanketed and cared for similarly to our best race horses. Special care is given to the feet to toughen and strengthen the foot pads. A red or a white woolen collar is put on each dog before the race. This identifies the dog and he is known as "Red" and the other dog as "White" regardless of body color. A judge on horseback, a timer, and a clerk stand half way down the field and the race is about to begin.

A long-eared, hopping jackrabbit is freed from the run beside the two ready straining speed-hounds. When the jack has a good 150 foot head start the leash is snapped, the dogs freed together and away they start, neck and neck, after the rabbit. The gap between the rabbit and dog closes. The "white" dog is ahead, he snaps at the rabbit but a quick dodge and turn and the rabbit is safe for a second. Again and again the dogs turn the rabbit. Finally the "red" dog catches the rabbit in mid-air and scores a kill. Each time the hare is turned scores for the dog that did it and a final point is made by the kill. The judge waves a white flag, score 7 to 5 favor of "white." Tomorrow "white" will run against another winner and so on until one dog by process of elimination stands supreme. Sometimes the rabbit makes a speedy trip

to the quarters and safety hole at the end of the field. Occasionally a good dodging rabbit runs for more than two minutes and unless a relief dog is turned in, the running greyhound may suffer heart

Just before being released—getting an even start.

collapse. Such was the case of the running to death of Golden Hawke last year because the time lmit was not observed.

The races are grouped in the following classes:

National Fall Futurity with 432 entries for 1926. These entries are made January 1, 1926.

The National Derby limited to 128 is an open stake or free for all.

The Waterloo limited to 64 is the classic race and corresponds to the Derby of horseracing. Greyhounds beaten in first round of Waterloo drop into the purse stake. Greyhounds winning one round and beaten in the second round drop into the plate stake.

There are other stakes in coursing, such as special puppy stakes, special all age stake, etc.

The National Coursing Association uses about $20,000 in purses each year. At the fall meet there will be about 500 dogs.

Many towns have their local coursing clubs and hold weekly meets.

From a veterinarian's standpoint, I have divided the diseases of greyhounds into two general groups: major common diseases, and minor common diseases.

Minor Common Diseases

Torn foot pads—due to sudden turning.

1. Alum water 20 per cent.
2. Flexible collodion.
3. Acidum glycerin tannici 20 per cent.
4. Put on boot.
5. Remove any flaps (surgically).

Broken toes and torn ligaments: Give period of rest and if necessary put cast of sodium silicate on. Radical removal of No. 1 and No. 5 or others, remove large dew claws.

Broken tails: Greyhound tail is like a rudder of a ship used in turning. Apply cast—corset staves of umbrella rib or hack saw blades for splint and brace with sodium silicate cast.

Fracture of leg bones: Set bones with splint and cold pack first 24 hours. When swelling goes down use water glass and bandage the whole leg. Give ultra-violet light treatment and X-ray as in human medicine in valuable dogs. Take out any splinters.

Interdigital serous cysts: Symptoms, constant gnawing of part. Remove all the cyst wall by dissection or cautery, not just tapping.

Maxillary fistula—upper jaw near eyelid—Causes: fourth premolar incrustations, infections, sudden jar or force on this tooth. Split tooth and extract, establish drainage and irrigate.

Infection of anal glands: Symptoms of obstipation, painful defecation and rubbing anus on the ground, squeeze out.

Inflammation of prostate: Usually chronic condition, pus in urethra or a perineal fistula develops. The swelling occludes the urethral canal and also interferes with defecation. Treatment: castrate—use local anesthesia, cocain hydrochlorid 2 per cent. Do not use over 1/16 gr. per pound of live weight.

Muscular rheumatism—give 5 grains of aspirin or other member of the salicylic acid group.

Eye troubles: Opacity of cornea or lens—milk treatment—5 cc. subcutaneously.

Removal of eyeball: Glass eye or operation after Doctor Dykstra's method.

Ulcers of the eye not due to distemper are very frequently related to kidney diseases and therefore the urine should be examined for sugar and albumin (give tests if needed).

The Major Common Diseases

The major common diseases of greyhounds are worms, distemper, and mange.

Internal Parasites: Ankylostoma canina (hookworms) very common in Kansas dogs, so that we always examine all dogs for evidence of this and other worms.

Our treatment is the regular carbon tetrachlorid or tetrachlorethylene treatment as recommended by Hall followed by a dose of salts. (Give amounts if necessary).

Belascaris marginata or Toxascaris limbata (roundworms) we use oil of chenopodium 10 mm. to pup, 15 mm. to 30 pound dog, depending on weight; follow with castor oil, ½ to 1 ounce. Santonin and calomel is also valuable as an anthelminthic, ⅛ grain up.

For tapeworms (there are eight different species), the common T. cucumerina or Dipylidium canina, we use ½ gr. arecalin hydrobromid and if we get no action in 20 minutes give a high enema.

The whipworm, Trichuris depressiusculus, is not harmful but can be removed by the chenopodium treatment. Overdosing of chenopodium may cause temporary deafness.

Fright disease or running fits: Repeated worming or symptoms of distemper in early form.

There are three common forms of canine mange:

1. Sarcoptic scabei.
2. Dermatophagus auricularis or Otodectes cynotis.
3. Demodex folliculorum.

We use the same treatment for the sarcoptic and demodectic mites though the results are very different. After one week's treatment the dog having sarcoptic mites is usually completely cured. The one having the demodectic takes a month or even longer to get results, so unless the value of the dog justifies treatment he should be destroyed. Alternate baths of warm solutions of 2 per cent creolin, or 4 per cent liquor formaldehyd, or 5 per cent lime sulphur dip are given one each day. Then one of the following prescriptions is used:

Marsteller's or N. Y. S. V. C.

℞

Kerosene	ʒ 8
Olei Lini	ʒ 8
Phenol	ʒ 1 to ½ Flynn
Sulphur flor.	ʒ 4
Oil tar	ʒ 1

or Univ. Penn.

℞

Creolini	part 1
Balsami Peru	part 3
Alcoholis	part 10

Misce.

or Blamey's

℞

Balsam Peru	ʒ iss
Anhydrous lanolin	ʒiij
Oleic acid	1/3
Olei gossippi	2/3 qs. ad Oj

Misce.

The dogs are held on a special leash that frees both animals at once.

The oil is rubbed on the worst areas

of infection and left on until the next week when we repeat the procedure.

The ear mange is treated by cleaning the canal with ether on swabs and then applying either itholis and glycerin a.a. or a mixture of carbon tetrachlorid one part, olive oil two parts.

The medicinal treatment of canine distemper consists of first removing all parasites, worms, fleas, and lice that tend to lower the resistance. Next treat symptomatically using 5 per cent oxide ointment for the eyes; protargol 5 per cent solutions for the nose, vapor rub or mentholatum. The digestive tract is assisted by the use of the following, one or more ounces twice a day:

℞

Lime water		
Cod liver oil	aa.	℥ 8
Beechwood creosote		℥ 1
Bismuth subnitrate		℥ 4

Misce.

The nervous form is given barbital 5 grains or more as needed.

Careful nursing is the important factor in treating distemper.

Literature

For those men interested in reading the best published material about dogs, I would advise reading the following books:

The Greyhound & Coursing by Adair Dighton, published by Grant Richards, Ltd., London, 1921.

The Complete Dog Book by Bruette, published by Stewart Kidd Co.

Canine Distemper by Hamilton Kirk, Alex Eger, 1922.

Surgical Diseases of Dog and Cat by Hobday, Chicago Medical Book Co., 1924.

Your Dog and Cat by Spaulding, 1921.

Diseases of Small Domestic Animals by Brumley, 1921.

Surgical Diseases and Surgery of Dog by French, 1923.

Diseases of Dog by Muller and Glass, 1925.

Dog Encyclopedia by Judy, 1922.

The Whippet—Race Dog—1896, by Freeman Lloyd.

Some good dog magazines to subscribe for are:

The Coursing News by Charles Horne, Manhattan, $2.00.

The Kennel Gazette—A. K. C., New York City, $4.00.

Dog World, Dogdom, Dog News, Kennel and Bench and many others.

COMMERCIALLY PRODUCED TUBERCULIN

Interesting figures published by the Division of Virus-Serum Control of the Bureau of Animal Industry, show that during 1925 a greater number of doses of tuberculin was produced than during any previous year. In fact, the figures show an increase of approximately 50 per cent over the year 1924. This report shows in detail that nearly 193,000 doses of subcutaneous tuberculin, about 209,000 doses of liquid ophthalmic tuberculin, 50,000 ophthalmic disks, and approximately 2,725,000 doses of intradermic tuberculin were produced by commercial agencies, a total of nearly 3,179,000 doses. In addition, 281,405 doses of avian tuberculin were prepared. When it is remembered that nearly all commercial tuberculin is used by practicing veterinarians, it can be readily seen that the tuberculin testing by approved and accredited men must be increasing.—B. A. I. Side-Lights on Tuberculosis Eradication, May, 1926.

Dr. I. K. Atherton, College Park, Md., in his "Vest Pocket Essay" for June 15th, states: "We must realize that there will be a scarcity of pig knuckles this fall. Not only is there a shortage of hogs, but reports from various parts of the country indicate that hog cholera is taking its annual toll. While Maryland has experienced but little of the disease this year, the time is fast approaching when swine raisers must be on the alert to protect their hogs from its ravages."

Homologous Anti-Canine-Distemper Serum as a Curative Agent*

H. B. WINTRINGHAM, Berkeley, Cal.

Some six years ago, as the volume of small animal work began to make itself felt in my practice, it became necessary to give it more attention and thought. I will frankly state that distemper, seemed to be the bane of this end of the practice. Various agents without end were tried as curatives. I have no doubt that this experience of mine is paralleled by the efforts of most thinking practitioners who have handled much distemper. The end result of these trials and experiences led me to believe that careful nursing and sanitation were the best weapons that we had to combat the disease.

The writer of this article has no financial interest in the production or sale of this or any other serum. He does not pretend that the clinical reports here given are the detailed scientific experiments upon which final conclusions as to the merits of the product may be drawn. This record of his experience is offered for the information it may contain for other practitioners and for the encouragement of those who may be equipped with the necessary skill, the resources and the desire to develop new and perhaps better weapons for the use of the practitioner in his battle with that fell destroyer of the dog—canine distemper.

However, as time passed, I have always believed that a specific eventually would be produced that would be a curative agent, and I began to be impressed with the striking similarity between hog cholera and canine distemper. Innumerable autopsies on both hogs and dogs suffering with these conditions made me a firm believer in the theory that primarily distemper is a filtrable virus disease. Apparently my theories have been borne out by the work already done in England by the Field distemper investigation.

Although anti-hog-cholera serum is not considered a curative agent, I still held the thought that perhaps a curative distemper serum could be produced along similar lines. With the idea of producing experimentally a serum along these lines, I interested Dr. R. C. Louck of the Louck Laboratories, who held the same views as myself and who had done some preliminary work along this line. The work was started the first of 1925 and has continued to date. Later on Dr. G. L. Millerick of Oakland became interested in the experiments and collaborated with us.

Along in September of 1925 a serum was produced and used extensively in the practices of both Dr. Millerick and myself, and a careful record was kept of the cases on which it was used. These records are appended to this article and are the ordinary clinical records as kept of cases in both Dr. Millerick's practice and my own. I personally believe that records of this kind are of more clinical value to the practitioner than a carefully checked record on strictly experimental laboratory animals, for the reason that they are the results of cases as presented in an actual practice. I do not wish, however, in any way to belittle careful

* Presented at the 1926 annual meeting of the Bay Counties Veterinary Medical Association.

laboratory experimentation which would still be essential before a serum of this kind was marketed. Such experiments I believe are being carried out by Dr. Louck.

The serum is produced from dogs that have been through an attack of distemper and are presumably immune to the disease. These dogs are hyperimmunized by the same or practically the same methods that are used to produce hyperimmunes in the production of anti-hog-cholera serum, using puppies that are sick with distemper as the antigen animals.

It has been interesting to note that some of the old dogs used in the work and which are known to have been through an attack of distemper, have come down with distemper, which seems to show that although an animal may have made a recovery from distemper, under certain conditions it again may be infected with the disease. By these secondary breaks, I refer to dogs that came down with distemper after the introduction of "hypering" virus. It has also been interesting to note that with the same lot of "hypering" virus the difference in reactions of the "hypered" animals has been varied, indicating that the natural immunity conferred by an attack of distemper varies in degree.

It seems strange that the first case the serum was used on in my practice was perhaps the most remarkable of the thirty-five reported in this paper from my practice. The results were so remarkable in this case that we perhaps became overly enthusiastic and at the time were convinced that no matter in what stage the disease was presented it could be cured by the use of the serum. Later results, however, convinced us that in this particular animal, although the tissue destruction must have been profound, it had not reached a stage where repair was impossible.

We are convinced from later developments that if cell destruction has gone beyond the point of repair, neither this nor any other agent will effect a cure, but if the cell destruction has not reached this point and the destructive agents can be neutralized or eliminated by the use of the serum, the life of the animal can be saved.

It was interesting to note in the work that serum presumably made polyvalent to the secondary invaders by combining them in the antigen for its production, showed a very much greater curative power than serum containing antibodies to the virus alone. However, in the initial stages of the disease the use of serum made from virus alone has seemed to be just as curative as the polyvalent serum. It was in the more advanced stages of the disease that the polyvalent serum seemed to be more effective.

As to whether or not a homologous anti-canine-distemper serum could come into general use is a question which we are not prepared to answer, as there are various factors which will of necessity govern its use aside from the question of its value in the treatment of distemper. One of these factors will be the supply, which from the nature of its production must be more or less limited. Secondly, because of the cost of its production, the price in a considerable number of instances at least prohibits its use. However, if its value as a curative agent is granted, there can be no question but that in a certain percentage of cases the relatively high cost would not be a hindrance to its use. As a matter of fact, in my own practice the cost of agents used in the treatment of diseased conditions seems to be readily acceded to by owners of animals and does not deter them from having expensive agents used. I have personally found that in the matter of charges the item of service in the cost of treatment is the only one that is ever questioned.

Aside from the practices mentioned, the homologous serum has been tried in several others in this region. A report of these cases is not included with the reports appended, because these veterinar-

ians do not wish their names used until they have had greater opportunity to observe the action of the serum under varying conditions. They report, however, that in a general way where they have been able to use it in the initial stages of distemper, it has seemed to abort the disease. In one practice where the veterinarian had been having pups breaking with distemper after going home when boarded with him for a short time, by the use of a 5 cc. dose of the serum on entering, the trouble appeared to be eliminated. This would, of course, indicate a passive immunity unless the puppy was exposed to the disease very shortly after the use of the serum, when a permanent immunity should be expected to develop.

Based on the above experience of this practitioner, Dr. Louck has been doing some very interesting work with a simultaneous vaccination, on which the writer is not as yet prepared to report. Experimentally in the laboratory, it is as nearly one hundred per cent effective as a product of this nature can be, but it has not yet been proved in the field.

The case reports on the use of homologous serum are practically self-explanatory, and I prefer in a paper of this kind not to attempt an analysis aside from the short summaries that both Dr. Millerick and I have written.

Since this series of case reports was written, the writer has used homologous anti-distemper serum on fifty additional cases; a widely known San Francisco practitioner has used it on thirty cases; and various practitioners in central California have used it on perhaps altogether fifty cases; making together with those here reported a total of approximately 175 cases of canine distemper treated with this serum and on which reports have been received. In the whole series and in the various divisions, there is a remarkable uniformity in the percentage of recoveries, the duration of the attack and the average amount of serum required, there being no material difference in these respects from the results shown and here reported in the first thirty-five cases treated.

Report on Use of Homologous Anti-Canine-Distemper Serum

No. 1. Fox Terrier, nine months old, male. Presented October 1, 1925. Temperature 103° F. Sick for two weeks. Typical case of pulmonary distemper. From the 1st to the 11th, it was given the usual treatment—mustard plaster, horse antitoxin, sulpharsephenamine, camphorated oil and atropin. Ate nothing from the 7th to the 12th. Emaciation profound. On the 12th given 10 cc. homologous serum in the afternoon. Began to eat on the following morning. Ten cc. homologous serum on the 13th, 15th, 16th, 17th, 19th, 20th, 21st, 23rd. Appetite continued excellent during this period, and there was a marked gain in weight with a gradual abating of the profuse nasal discharge. Though weak, the patient became quite active. On the 24th jumped out of his kennel from a height of five feet to the cement floor with considerable jar. On the 25th appetite gone; given 10 cc. homologous serum. Appetite returned on the 26th. Ten cc. homologous serum on the 27th. From this time on, his recovery was uneventful until he was discharged cured on November 10, 1925, except for an eczema that appeared from over-feeding and which disappeared after a few doses of orange juice. Serum used, 110 cc.

No. 2. Collie, male, ten months old. Presented October 12, 1925. Temperature 103° F. Given 10 cc. homologous serum on the 15th. Appetite returned on the 16th with temperature normal. Given 10 cc. homologous serum and .5 gram sulpharsephenamine on the 19th. Given 10 cc. homologous serum on the 20th and discharged cured on that date. Serum used, 30 cc.

No. 3. Japanese Spaniel, female, five months old. Presented October 21, 1925. Temperature 104° F. No appetite. Sick five days. Given 5 cc. homologous serum on the 21st, 22nd, 23rd, 24th and 25th. Temperature normal on the 23rd and some improvement in appetite. On the 24th some nervous symptoms developed. The animal was not presented again until the 30th with pronounced nervous symptoms and was given 10 cc. homologous serum on this date and neonal. Animal died on the 31st. Autopsy revealed a severe intestinal inflammation and a considerable number of roundworms. Serum used, 35 cc.

No. 4. Boston, male, six months old. Presented October 19, 1925. Temperature 103° F. Sick one week. Bad cough. Given 10 cc. homologous serum on the 19th, 20th and 21st. Temperature normal on the 20th. Discharged on the 24th with slight cough and still some discharge from eyes. Animal made a complete recovery. Serum used, 30 cc.

No. 5. Boston, female, 14 months old. Presented October 19, 1925. Sick one week. Temperature 104° F., with skin lesions. Given 10 cc. homologous serum on the 19th, 20th, 27th and 29th. Made an uneventful recovery, temperature dropping to normal after the second injection of serum. Serum used, 40 cc.

No. 6. Boston, female, four months old. Presented October 21, 1925, with a bloody diarrhea and passing tapeworm segments. Sick two weeks. Temperature 100° F., with discharge from eyes and nose. Given 10 cc. homologous serum on the 21st. Dead on the 22nd. Serum used, 10 cc.

No. 7. Boston male, three months old. Presented October 24, 1925, with temperature of 104° F. and slight watery discharge from eyes and nose. Given 10 cc. homologous serum on the 24th with 1 cc. distemper bacterin. Presented again on the 27th. Temperature normal and discharge gone from eyes and nose. Given 1 cc. bacterin on this date. Not seen again but reported O. K. Serum used, 10 cc.

No. 8, Fox Terrier, female, one year old. Presented with temperature 103.8° F. and stiffness, October 23, 1925. Sick two days. Given 10 cc. homologous serum on the 23rd and 24th. Temperature normal on the 24th and stiffness gone. Appetite returned on the 25th. Discharged as completely recovered on the 27th. Serum used, 20 cc.

No. 9. Police, male, six months old. Sick for three weeks with advanced case of pneumonia and enteritis. Given two doses of homologous serum of 10 cc. on the 24th and one dose on the morning of the 25th. Dead afternoon of the 25th. Temperature 99.5° F. at time presented. Serum used, 30 cc.

No. 10. Shepherd, male, one year old. Presented December 7, 1925. Sick one week. Temperature 104° F. Bad cough and no appetite and usual discharge from eyes and nose. Given 10 cc. homologous serum on the 7th, 8th and 9th. Temperature normal and appetite returned on the 9th. Discharged with slight cough on the 12th. Made an uneventful recovery. Serum used, 30 cc.

No. 11. Airedale, male, one year old. Presented November 4, 1925. Sick six days. Temperature 104° F. Pneumonic symptoms. Pneumonia jacket used. Given 20 cc. homologous serum on the 4th. Discharged cured on the 9th. Serum used, 20 cc.

No. 12, Police, male, 14 months old. Presented December 6, 1925. Sick one week. Temperature 103.8° F. No appetite, profuse discharge from nose and eyes. Given 20 cc. homologous serum on the 7th and 8th, and 10 cc. on the 9th. Temperature normal on the 8th with re-

turn of appetite. Eye and nasal discharge disappeared gradually, and patient was discharged cured on the 20th. Serum used, 50 cc.

No. 13, Kerry Blue Terrier, female, one year old. Presented November 14, 1925. Sick ten days. Temperature 103° F. Heavy discharge from eyes and nose. Bad diarrhea. Given 10 cc. homologous serum and 10 cc. horse serum on the 14th; on the 15th 30 cc. horse serum; on the 18th 1 cc. bacterin. During this period there was a marked improvement in the discharge from the eyes and nose and the appetite was much improved, but the diarrhea persisted. On December 7th and 8th, given 20 cc. each homologous serum, and on the 9th, 10 cc. homologous serum. The diarrhea was eliminated but returned on the 17th, when a further dose of 10 cc. homologous serum was given, and the animal was discharged cured on December 23rd. Serum used, homologous 70 cc; horse 40 cc.

No. 14. Police, male, two years old. Presented November 13, 1925. Sick one week. Temperature 104° F. Bad eye and nasal discharge and deep hacking cough. Given 10 cc. homologous serum on the 13th and 14th. Marked improvement on the 15th with return of appetite and disappearance of discharges. Temperature normal on this date. Made an uneventful recovery and was discharged on the 23rd. Serum used, 20 cc.

No. 15. Collie, male, ten months old. Presented October 15, 1925. Sick one week. Temperature 103° F. No appetite and usual eye and nasal discharge. Given 10 cc. homologous serum on the 15th. Marked improvement on the 16th. Some relapse on the 19th and was given on this date 10 cc. homologous serum and .5 gram sulpharsephenamine. Practically complete recovery on the 20th but was given a further dose of 10 cc. homologous serum on this date and discharged cured on the 21st. Serum used, 30 cc.

No. 16. Airedale, male, seven months old. Presented November 13, 1925. Sick six days. Temperature 104° F. Eye and nasal discharge and no appetite. Given 10 cc. homologous serum on the 13th and 15th, with complete recovery on the 20th. This animal had been presented on October 24, 1925, with a compound fracture of the left hind leg and still wore his cast and was treated for this trouble during the attack of distemper. He was finally discharged on November 27th with the leg completely healed. Serum used, 20 cc.

No. 17. Shepherd, male, six months old. Presented December 13, 1925. Sick four days. Temperature 103.8° F. No appetite; eye and nasal discharge. Given 10 cc. homologous serum. Temperature normal and appetite returned on the 14th. Discharged on the 18th cured. Serum used, 10 cc.

No. 18. Boston, male, three months old. Presented December 15, 1925. Sick three days. Temperature 103.5° F. No appetite; diarrhea. Given 10 cc. homologous serum and acidophilus milk to be used at home. On December 16th reported appetite returned and diarrhea better. December 18th reported animal normal in every respect. Serum used, 10 cc.

No. 19. Police, female, eleven months old. Presented December 15, 1925. Sick two days. Temperature 104.5° F. Congested eyes and no appetite. Given 10 cc. homologous serum on the 15th. Temperature on the 16th, 104.6° F. Given 10 cc. homologous serum on this date. Temperature normal on the 17th, eyes cleared up and appetite returned. This animal was presented again on January 2, 1926, and died the following day. Autopsy revealed a carcinoma of the stomach. Serum used, 20 cc.

No. 20. Boston, male, eight months old. Presented December 21, 1925. Sick ten days. Temperature 103° F. Discharge from eyes and nose. Convulsions. Given 8 cc. homologous serum. Died on the 22nd. Serum used, 8 cc.

No. 21. Collie, female, six months old. Presented December 31, 1925. Sick three days. Temperature 102.5° F. Congested conjunctiva. No appetite. Given 10 cc. homologous serum on the 31st. Temper-

ature normal on January 1, 1926, and appetite returned. Discharged cured on January 2nd. Serum used, 10 cc.

No. 22. Same as No. 21, except temperature at time of presentation was 103° F. Serum used, 10 cc.

No. 23. Same as No. 21, except temperature at time of presentation was 103.5° F. Serum used, 10 cc.

No. 24. Boston, male, eight months old. Presented October 31, 1925. Sick three weeks. Temperature 102.5° F. No appetite. Skin eruptions, nasal and eye discharge. Given 10 cc. homologous serum on October 31st, November 1st, 2nd, 3rd and 4th. Appetite gradually returned; eyes and nose cleared up. Discharged cured on November 13th. Serum used, 50 cc.

No. 25. Terrier, male, ten months old. Presented December 26, 1925. Sick five days. Temperature 103° F. No appetite; discharges from eyes and nose. Given 10 cc. homologous serum on the 26th. Temperature normal on the 27th and began to eat on the 28th. Discharged cured on the 31st. Serum used, 10 cc.

No. 26. Fox Terrier, male, ten months old. Presented December 24, 1925, with a cecitis. Cecectomy was performed on that date. On the 27th patient showed typical eye and nose discharges, with temperature of 102.5° F. Diarrhea developed, which, however, might be attributed to the cecectomy. Given 10 cc. homologous serum on the 27th, 28th and 29th. Symptoms were all cleared up by January 4, 1926, and animal was discharged on January 7th. Serum used, 30 cc.

No. 27. Hound, male, eight months old. Presented January 4, 1926. Sick one week. Temperature 104° F. Bad cough. No appetite. Eye and nasal discharge. Given 10 cc. homologous serum on the 5th and 6th. Symptoms cleared up and animal was discharged cured on January 11th. Serum used, 20 cc.

No. 28. Bull, female, four months old. Presented January 14, 1926. Sick eight days. Temperature 102.5° F. Bad cough and heavy discharges from eyes and nose. Given 10 cc. homologous serum on the 14th and 5 cc. on the 15th. Symptoms cleared up and animal was discharged on the 20th. Serum used, 15 cc.

No. 29. Police, female, six months old. Came down with distemper November 15, 1925, and was treated by two other veterinarians with bacterins and horse serum until January 6, 1926, on which date the animal was presented to me for treatment. At this time the temperature was 102.5° F. Congested eyes and nose. Convulsions. Given 10 cc. homologous serum on the 6th and all baby teeth were removed which should have been shed. The convulsive symptoms were reported better and the appetite returning during the next two days, and on January 9th an additional dose of 10 cc. homologous serum was given. Continued improvement was reported until January 18th, when the animal had a convulsion and passed some roundworms. She was wormed on the 19th, passing large numbers of roundworms. Continued improvement was reported up to January 25th, except for some choreic twitching of the right hind leg. Serum used, 20 cc.

No. 30. Hound, female, seven months old. Presented January 8, 1926. Sick ten days. Temperature 102.5° F. Bad cough and discharges from eyes and nose. Given 10 cc. homologous serum on the 8th; 8 cc. on the 14th; and 5 cc. on the 15th. Animal discharged on the 16th with a slight cough but otherwise normal. Serum used, 23 cc.

No. 31. Fox Terrier, male, ten months old. Presented January 16, 1926. Sick one day. Temperature 104° F. Slight cough. Given 10 cc. homologous serum on this date. Reported O. K. on the following two days. Serum used, 10 cc.

No. 32. Bull Terrier, male, six months old. Presented January 23, 1926. Sick three days. Temperature 103° F. Cough and discharge from nose and eyes. Given 10 cc. homologous serum on the 23rd; 5 cc. on the 24th and 10 cc. on the 25th. On the 26th severe pneumonic symptoms developed and a mustard plaster was applied. The temperature remained at 103°

F. during this period. On the 26th the patient was given .2 gram sulpharsephenamine intravenously, 2 cc. spleen extract, 20 cc. horse serum and 10 cc. homologous serum. On the 27th he was given 2 cc. spleen extract. On the 28th, 20 cc. horse serum as also on the 29th and 30th. At this time the pneumonic symptoms had subsided. The animal's appetite remained good throughout this period. On the 31st, given 10 cc. homologous serum. The animal showed a tendency to convulsions on this date. Wormed on this date but revealed no parasites. The convulsions developed strongly with an appearance of considerable pain, and the animal died on February 5th, having received a further dose of homologous serum of 10 cc. on the 4th. Autopsy revealed a slight enteritis and a very much enlarged and distended cecum. The lungs showed a stage of resolution. Serum used; homologous, 55 cc; horse, 80 cc.

No. 33. Boston, 18 months old. Presented January 20, 1926. Sick four days. Temperature 104° F. No appetite. Discharge from nose and eyes. Given 10 cc. homologous serum on the 20th, and 2 cc. bacterin on the 21st. Temperature normal on the 22nd and began to eat. Temperature 102.5° F. on the 24th and given 5 cc. homologous serum. Temperature normal on the 25th. Still some discharge from nose and eyes. Given 10 cc. homologous serum on the 26th. Discharges cleared up on the 28th and animal went home cured on February 3rd. Serum used, 25 cc.

No. 34. Airedale, six months old. Presented January 18, 1926. Sick one week. Temperature 102.5° F. Cough and no appetite with usual discharges. Had had two fits two days previous to treatment. Given 10 cc. homologous serum on the 18th and wormed. Passed a considerable number of roundworms on the 19th. Temperature normal and cough gone on the 20th with return of appetite. Discharged cured on the 25th. Serum used, 10 cc.

No. 35. Boston, female, three months old. Presented January 19, 1926. Sick one week. Had been having fits. This puppy showed rickets, ulcer of one eye, heavy discharge from eyes and nose and very much bloated, with temperature 103° F. Given 10 cc. homologous serum on the 18th and cod liver oil. Mercurochrome applied to eye. Given 5 cc. homologous serum on the 19th, and on the 20th the same, with the same internal and local treatment. On the 19th given carbon tetrachlorid and passed eight roundworms. Condition improved and appetite picked up. Given an additional dose of 5 cc. homologous serum on the 24th. Puppy discharged cured on the 27th. Serum used, 25 cc.

Summary

In this series of 35 cases, there were five deaths or 14.5%, making for an efficiency of the homologous serum of 85.5%. However, three of these five fatalities should hardly be considered, as in the writer's opinion they were moribund at the time they were presented, since the tissue changes were so serious as to be beyond repair. In the writer's opinion, case No. 32 died of complications, which seem to be substantiated by the autopsy findings. Case No. 3 apparently improved for a day or two, then developed nervous symptoms and died and on autopsy showed an infestation of roundworms. It may be possible that this infestation was the cause of the convulsions and death. Deaths in this series occurred in Nos. 3, 6, 9, 20 and 32.

The following classifications are made of the remaining cases from a clinical standpoint:

Classification No. 1: Those cases which in my opinion would have died under other treatments as ordinarily given and having no specific agents and whose cure may be directly attributed to the use of homologous serum. There are seven of these out of the thirty recoveries, Nos. 1, 13, 15, 19, 26, 29 and 35. Average time of treatment, 14.5 days. Average homologous serum used, 46.5 cc.

Classification No. 2: Those cases which in my opinion would have recovered under other treatments as ordinarily

given and having no specific agents, but which recovered in a much shortened period of time by the use of homologous serum. There are twelve of these out of the thirty recoveries, Nos. 2, 4, 10, 11, 12, 14, 16, 17, 25, 27, 28 and 34. Average time of treatment, 6.7 days. Average homologous serum used, 22 cc.

Classification No. 3: Those cases which were caught in the earliest apparent stages and which by the use of homologous serum were seemingly immediately checked. There are seven of these out of the thirty recoveries, Nos. 7, 8, 18, 21, 22, 23 and 31. Average time of treatment, 1.4 days. Average homologous serum used, 11.5 cc.

Classification No. 4: Those cases that are questionable as to whether or not the use of homologous serum was any better in their treatment than other treatments as ordinarily given and using no specific agents. There are four of these out of the thirty recoveries, Nos. 5, 24, 30 and 33. Average time of treatment, 10.6 days. Average homologous serum used, 34.5 cc.

Because of the scarcity of the homologous serum, the average amount of the doses and their repetition as used in the majority of the cases were the minimum to produce results, and in the writer's opinion the results would in all probability have been more marked if the minimum dose used had been 20 cc., and particularly if the initial dose had been this amount.

It was interesting to note the relation of parasitic infestation to convulsions in this series.

Report of Cases Treated by Dr. G. L. Millerick

No. 1. December 12, 1925. Half-bred Bull and Shepherd, ten months old. Temperature 103° F. Sick one week. No appetite. Gave 10 cc. homologous serum; twenty-four hours later temperature was 101.6° F. Animal ate a raw egg. Next morning temperature 101° F. Continued to eat and went home in five days apparently recovered, except for slight nasal discharge.

No. 2. December 16, 1925. Half-bred Airedale and German Shepherd. Sick five or six days. Had not eaten for two days. Temperature 103.6° F. Gave 10 cc. homologous serum. Next morning patient ate a raw egg. That evening ate a little beef broth. Temperature 102° F. Went home on the fourth day apparently well.

No. 3. December 18, 1925. Fox Terrier puppy, two months old. Temperature 103.8° F. Discharge from eyes and nose; very bad diarrhea. Had been sick three days. Gave 5 cc. homologous serum. Temperature 103.4° F. Took raw egg next morning. Gave 5 cc. serum and that evening the puppy had a hemorrhage of the bowels. No more homologous serum available. Animal died on the fifth day.

No. 4. December 21, 1925. Wire-haired Fox Terrier, two months old. Temperature 104° F. Discharge from eyes and nose, cough and diarrhea. Gave 5 cc. homologous serum. Next morning patient ate a raw egg. Temperature 103.4° F. Gave 5 cc. more serum. Animal took a little broth and raw hamburger that evening. Showed no improvement and died in convulsions on the sixth day.

No. 5. December 26, 1925. German Shepherd, seven months old. Discharge from the nose. Very bad diarrhea. Temperature 104.8° F. Had not eaten for two days. Gave 10 cc. homologous serum. Force fed a raw egg. Next morning temperature 104.2° F. Force fed raw egg and gave 10 cc. serum; in the evening another raw egg. Next morning temperature 104° F. Force fed raw egg. In the evening patient voluntarily ate egg and milk. Next morning temperature 103° F. Appetite improved. Animal continued to improve and went home in eight days.

No. 6. January 2, 1926. German Shepherd, ten months old. Sick one day. No appetite. Sneezing and gagging. Temperature 103.4° F. Gave 10 cc. homologous serum. Next morning tempera-

ture 101.6° F. Appetite good. Went home on the fourth day.

No. 7. January 10, 1926. Spitz, five months old. Coughing and gagging. Slight discharge from the nose. Temperature 103.2° F. No appetite. Gave 5 cc. homologous serum. Next day temperature 102.6° F. Ate a raw egg. Gave 5 cc. homologous serum. Patient ate some hamburger that evening. Animal brought back to the hospital and after two days temperature 102° F. Apparently doing well.

No. 8. January 16, 1926. Boston Terrier, eight months old. Coughing, gagging and sneezing. Sick two days. Would eat a little. Temperature 103° F. Gave 10 cc. homologous serum. Animal brought back following day. Temperature 101.6° F. Seemed to be feeling fine, very hungry, so did not give further treatment.

No. 9. January 20, 1926. Boston Terrier puppy, six weeks old. Had been boarding with me for two weeks. Began discharge from the nose and became depressed. Temperature 102.6° F. Gave 5 cc. homologous serum. Next morning temperature 102° F. Patient much brighter. Gave 3 cc. homologous serum. By the following day discharge from the nose had ceased. Gave 2 cc. serum. Animal doing well ever since.

No. 10. January 25, 1926. Half Airedale and Terrier. Bad diarrhea. Discharge from the eyes and nose. Sick about two weeks. Had a few convulsions. Gave 15 cc. homologous serum. Temperature 102.8° F. Temperature next morning 102° F. Gave 10 cc. serum. Dog had two convulsions, but ate. Gave nothing to eat but a raw egg and little milk. Gave 10 cc. homologous serum. Animal had one more convulsion and went home well in nine days.

Summary: Cases Nos. 1 and 2 possibly would have recovered under the old symptomatic treatment. Cases Nos. 6, 7 and 9 were caught in the very first stages. Use of the serum seemed to abort the disease. Cases Nos. 5 and 10, I am positive, would have been fatal without the serum. Cases Nos. 3 and 4 were very small puppies and the weather was extremely cold. I do not believe that my place was kept warm enough for them to have a fair chance for recovery.

General Comment

By way of general comment, I may say that first of all the paper has as its foundation the theory that distemper is a filtrable virus infection primarily, and if this is not assumed, then the production of this serum must fall flat in so far as its anti-virus properties are concerned. We tried at one time serum taken from dogs that had recovered from distemper without any hypering, and the results were absolutely negative. At the time that this was done, Dr. Louck gave me several bottles of serum that simply carried a number. Some of these contained normal serum and some hyperimmune serum. He did not tell me which was which, fearing that, even though I was open-minded, I might be prejudiced in analyzing the results. These two types were used, and we conclusively proved to our own satisfaction that the normal serum was of no value, that is, at least in 10 cc. and 20 cc. doses. I did not use any larger doses.

All cases in the report were kept track of after they were discharged for relapses that so frequently occur where the ordinary treatment for distemper is employed. This period varied from a month to two months in some instances, and in no case did symptoms of distemper recur.

I would again remind the reader that the case reports are taken from actual practice. This precludes the keeping of the animals over a long period of time, for it is my policy as soon as an animal is over the crisis and on the road to recovery to send it home. When sent home my instructions are to feed sparingly for a week or two with an easily digested diet, not to exercise and to keep very warm. When these instructions are adhered to, there is no relapse. I am not

saying that there will be no relapses after the use of homologous serum. That there were none in the cases treated, I attribute to the fact that I simply impressed the owners of these animals strongly enough so that they carried out instructions.

Adenitis

H. H. NEWCOMB, New York City

THIS DISEASE was early recognized as one to which colts were particularly susceptible. For many years it was supposed to affect only the young and to be distinct from a similar malady in the adult which is now known to be identical.

It has been variously described as strangles, distemper and contagious coryza. Adenitis, however, seems to be the most significant single descriptive term as it at once suggests an inflammation of adenoid tissue. The abundance of tissue of this type in the submaxillary space accounts for the frequency of lesions in this area.

The etiological factor, Streptococcus equi, most frequently gains entrance through the nasal mucosa where it sets up an acute catarrh followed by suppuration of the submaxillary glands. Usually all of the animals in the stable are affected with the exception of those which have previously recovered. As one attack often confers immunity for life, patients over five years of age are not frequently presented for treatment. As with most infectious diseases exposure to cold, lack of proper nutrition and all conditions tending to lower vitality are predisposing causes. Their avoidance, therefore, constitutes prophylaxis of the highest order.

Though the mortality of this disease is not high it occasions a considerable economic loss through retarded development in the very young and loss of work of the older animals. The incubation period is short, sometimes lasting only a day or two, but usually about a week.

The early symptoms are those common to most febrile affections; loss of appetite, debility and elevated temperature. Almost simultaneously there appears a clear nasal discharge which soon becomes purulent and profuse. Acute catarrh of the conjunctival, buccal and pharyngeal mucous membrane appears usually accompanied with a pronounced cough.

About this time the characteristic symptom is noted. The submaxillary glands become markedly swollen and coalesce filling the whole intermaxillary space. The swelling is hard, warm and painful to the touch and causes the animal to hold its head in an extended position. After a few days points of fluctuation appear from which the hair falls off and a sticky fluid exudes. These areas become cone-shaped and the skin finally bursts releasing quantities of creamy pus. The swelling then begins to disappear and as the discharge lessens, the cavities begin to fill up with granulation tissue. Other symptoms abate and there is a gradual return to normal.

The treatment is varied according to the development of the symptoms.

Hygienic surroundings are essential. Antipyretics are indicated when control of temperature seems desirable and stimulants may be required for cardiac support. Much depends upon the local treatment. Swelling of the glands may be so extensive as to threaten life by asphyxiation. In such cases tracheotomy must be resorted to promptly.

In spite of the fact that formerly abortive measures were considered of little value we now have, in Antiphlogistine, an agent which is productive of most pleasing results. If applied early it will, in many cases, prevent suppuration and materially shorten the course of the disease.

Oftentimes the case is not seen until the disease is well established. It is then desirable to hasten the suppurative process in the glands and promote an early evacuation of pus. Counter-irritants are of doubtful value and may even do harm. The application of moist warm dressings to dependent parts was formerly beset with many difficulties. Ordinary poultices were of little value as they could not be kept in contact with the swollen glands and required frequent renewal. With the employment of Antiphlogistine these difficulties have been overcome. This antiseptic dressing adheres to the surface, relieves the pain and needs to be changed only once in twelve hours. Abscesses which have matured under this treatment and have ruptured or been opened begin at once to fill up with healthy granulation tissue. Typical cases then progress toward early recovery while atypical cases require such treatment as the symptoms indicate.

The writer's experience with this disease has been in the large shipping centers and aboard transports. Where antiphlogistic treatment could be instituted early in the attack, more than one per cent of fatalities rarely occurred.

Poisonous Plants

L. H. PAMMEL, Dept. of Botany, Iowa State College

VIPER'S BUGLOSS

Dr. W. F. Wilkinson of Utica, New York, writes as follows:

"I am enclosing a weed which I believe to be poisonous. Write me its characteristics and to what animals it may be poisonous."

The plant sent is viper's bugloss (Echium vulgare), a bristly, rough biennial with blue or roseate flowers, a common weed of the east and rarely found westward. The bristly hairs often inflict mechanical injuries. Friedberger and Fröhner list it as one of the poisonous plants and that it produces slavering. This undoubtedly is caused by the bristles on the plant. It has been found in recent years that quite a number of the borages have powerful toxins. No doubt this plant has some of these substances. These plants are poisonous to many different kinds of animals. Cynoglossum, to which this is related, is poisonous.

The wild comfrey (Cynoglossum virginianum), which is suspected of being poisonous in this country, is related to the European species of hound's tongue (Cynoglossum officinale), which contains a powerful alkaloid, cynoglossin, which resembles curare in its action. Therefore these borages all should be suspected and avoided.

CONE-FLOWER SUSPECTED OF POISONING HOGS

Mr. W. H. Burns, Assistant Professor of Plant Diseases, Iowa State College, has received from E. M. McGinnis, Audubon, Iowa, the following letter, which he transmits to me:

"I am sending you a few specimens of a weed that our local veterinarian says is poisonous to hogs. A few days ago I visited a farmer near Exira that lost a couple of hogs. One of the hogs was found dead in a stream with its head under the water. A few days later another hog was found in the stream. Upon examination of the animal by the veterinarian he pronounced it poisoned by this weed. Will you please let me know the facts pertaining to this weed, and if poisonous, how it may be eradicated?"

From time to time I have published a few notes on the matter of the poisoning from this cone-flower which is known to botanists as Rudbeckia laciniata. This

cone-flower grows in low ground, has a rather disagreeable odor, has deeply divided leaves, and yellow flowers. Several requests have come to me for information on the poisonous properties of this weed. The statements were generally to the effect that the plant had poisoned cattle, but it seems that Mr. McGinnis is of the opinion that it might be injurious to hogs. I am publishing this note so that other cases of hog poisoning may be reported to me. No experiments have been made with reference to this plant, but from the numerous requests that have been received, I am inclined to think that the weed is poisonous.

NECROTIC ENTERITIS IN PIGS

My attention has been called recently to several cases of necrotic enteritis in small pigs, some of them not more than three weeks old and others weighing from twenty to thirty-five pounds. My success in treating cases of this kind has not been all that it should be, unless the trouble is ordinarily hard to control. I examined some pigs not more than three weeks old and found indications of enteritis together with a few petechiae on the kidneys, much reddened lungs and slightly hemorrhagic glands. These pigs have been dying at the rate of about seven or eight a week.—H. H.

Reply by A. T. Kinsley: Necrotic enteritis or pig typhoid is quite prevalent in various sections of the country. The malady exacts a heavy toll and is the most difficult disease of swine to control. The primary cause of necrotic enteritis is the B. suipestifer, but insanitary surroundings and improper feed are important predisposing factors. The losses from necrotic enteritis can be reduced to a minimum by regulating the diet, providing reasonably sanitary surroundings, and the use of a specific bacterin prepared from the B. suipestifer. The best diet for this condition is a liquid or semi-liquid one containing a relatively limited amount of solids. It has been found that to render the feed alkaline by the use of caustic potash or lye and the use of some antiseptic in the feed may also be of value.

The bacterin prepared from the B. suipestifer has been found, experimentally, to increase the animals' resistance to the disease and is a valuable immunizing agent when used in swine that have been exposed to infection. In exposed herds, it is usually advisable to use two injections three or four days apart.

ANSWERS TO HORSE QUERIES

In the February issue of Veterinary Medicine, I note a number of questions concerning equine practice by Dr. Kinsley and submit the following in reply to three of the queries:

What is an effective method of breaking a horse or mule of halter pulling? Use a common halter. Fasten a one-half inch rope around the neck of the horse, run through ring of halter and tie to an object that the horse cannot break.

What is the cause and treatment of chest founder? There is no such thing as chest founder. I presume what is meant is acute or chronic laminitis, the treatment for which is potassium nitrate in large doses. Omit grain from the feed. Poultice feet 12 hours on and 12 hours off with 25 per cent salt in the poultice, or turn to wet grass or soak feet in tub.

What is the cause and treatment of tongue lolling? As nearly a cure as I have found is to have an overhead check and instead of a small bit, have a strap go under the lower jaw ahead of the bit in the mouth. As long as this is used, the horse or mule will not loll his tongue as he cannot open his mouth to get his tongue out.

B. F. Ward, M. D. C.

Glenwood, Ia.

PROLAPSE OF GREAT COLON AND CECUM IN MARE BEFORE PARTURITION

The subject was a nine-year-old mare, about 1400 pounds in weight. She had been taken from pasture the same day with other horses. She was due to foal any time. It was noticed that she commenced to strain on arrival home. The owner thought it was labor pains. When part of the large intestines protruded, he called me.

I did not arrive until the cecum and almost all of the great colon had prolapsed. The mare was lying down in the barnyard, and the prolapsed intestines were covered with dirt. No attempt was made to replace the intestines, but since the owner wanted to save the colt, a hasty cesarean operation was performed without anesthesia (for which a bystander accused me of cruelty) and the animal shot immediately after.

I have never seen prolapse of the cecum and great colon before, nor can I find it described in any textbooks or journals. I did not think it was possible for the large intestines, moderately filled with ingesta, to prolapse through the small colon and rectum. In my opinion, replacement would have been impossible without rupturing the intestines.

O. W. Johnson, D. V. M.

Davenport, Wash.

TRILLIUM SUSPECTED OF POISONING

Dr. J. V. H. Schantz of Fairfield, writes as follows:

"I am sending you a weed specimen I found in a timber pasture which I would like to have you identify. I cannot find the plant described in any literature I have on hand."

The plant sent is a member of the lily family and is known as wake robin or snow trillium (Trillium nivale). Trilliums have long been considered poisonous. All species are emetic. Lindley states that the roots have a violent emetic action. The fruit should be regarded with suspicion. Aside from this, not very much is known.—L. H. Pammel.

PIECE OF BOARD IN HORSE'S NECK

I have a case of a seven-year-old, black saddle horse which was stabbed by a piece of board off a fence. The board splintered, and a piece about three inches wide and one inch thick penetrated to a depth of about ten inches. It entered the neck just lateral to the jugular vein, so close one could see the vein in the wound, ranged under the scapula and slightly downward. It entered at a point just above the prescapular lymph node.

The owner was so insistent that the wound be sutured that I sutured the upper half and left the lower half open for drainage, leaving a syringe and liquor cresolis compositus with instructions to wash out daily. The animal got along well for a week, with very little discharge from the wound and practically no swelling. At this time the patient walked with very little lameness in this leg (right).

During the next several days the horse began to get stiff in the front legs. I saw him seven days later or about eighteen days after he was wounded, when he presented the following symptoms: Pulse, respirations, temperature practically normal; very stiff in both forelegs when forced to move; would move in a circle before he could be made to move off and then very slowly with head down and taking only a few steps at a time; would get his hind legs under him and move almost identically as if foundered; would rest the opposite foreleg as in radial paralysis; very little appetite. The wound was healing with very little pus. I left a physic bolus and nux vomica, the latter to be given once a day.

A week later the horse presented the same symptoms, only he would rest the wounded leg as he previously had rested the opposite leg. As there was some pus in the wound, I incised it and established drainage about four inches lower down

KANSAS STATE AGRICULTURAL COLLEGE JUL 31 1926 LIBRARY

the neck. The patient would stand relaxed with all feet rather tucked under him with head down, showing a very depressed appearance. While packing the wound after establishing drainage at a certain point (I must confess I couldn't exactly tell where), the pressure of pushing the pack in the wound would cause the animal to become rigid in his forelegs and he would gather himself together as if moving off but would not take a step.

A week later—no improvement.

What caused this condition to develop a week after the injury and as the animal was making a good recovery?

Could he have injured the brachial plexus? If so, why should he be the same in both legs? Also why did the condition develop in a week? Why not as soon as injured?

Could absorption of liquor cresolis compositus solution cause this condition?

The case has been a very perplexing problem to me, and I should appreciate any information that readers may be able to give.

M. W. Emmel

Wilson, Ark.

HOSPITAL RECORDS

We make out in triplicate our hospital chart or record, figure the approximate cost and length of time the patient is due to stay in the hospital and get the cash down right away. One copy is given to the client, another is filed in our "In" book, and the other goes on the dog's cage. When the patient leaves the hospital, the record is completed and placed in our "Out" file. Every year the records are removed from the "Out" file and bound in book form for reference. Where only an examination is made, two copies are filled out, one given to the owner and the other placed in the "Out" file.

Our bookkeeping is very simple—two columns in the cash book, one for cases entered and money received, the other column for money expended. Every day the sums are totaled and the amount from the previous days of the month brought forward, adding up the total to date of the days of the month. In that way we know at the end of every day how much has been made and how much spent, and by subtracting we have the net to date. In the front of the cash book is kept a small chart giving the amount of cash taken in and the amount spent every month for the past three years, so I can see at the end of every month when I enter the totals how things are going and the percentage of increase.

J. G. Horning

Houston, Texas

A NEW BOOK ON FOXES

"Theory and Practice of Fox Ranching" is the title of a new and comprehensive work on foxes by J. A. Allen, V. S., B. V. Sc. and W. Chester S. McLure, M. L. A. (P. E. I.).

Dr. Allen is said to be the first veterinarian to devote his entire time to the study of fox diseases. He was commissioned by the Canadian government to establish the first fox farming research station, and after eight years of service to the industry, he is conceded to be the best authority on ailments of the domesticated fox. He was the first to draw the attention of veterinarians to the possibilities of fox practice, and today nearly all fox ranches of any importance are engaging veterinarians as ranch managers.

Mr. W. Chester S. McLure, Member of Parliament for Prince Edward Island, has had sixteen years' experience as a practical fox farmer, fur expert and fox judge.

The reputation and ability of the authors are such as to insure a complete and thorough presentation of the subject in which they are specialists, and specimen pages of the book indicate it to be in every way a high class work. The first edition, which is limited, is just off the press. It is published by the Prince Edward Island Publishing Co., Charlottetown, Prince Edward Island, Canada. The price is $5.00. All veterinarians who are interested in foxes will find this book a valuable source of practical information.